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University of California
Berkeley, California

Western Mining in the Twentieth Century Series

J. Ward Downey

MINING AND CONSTRUCTION ENGINEER, INDUSTRIAL MANAGEMENT CONSULTANT, 1936 TO THE 1990s

With an Introduction by
Philip Read Bradley, Jr.

Interviews Conducted by
Eleanor Swent
in 1991

Since 1954 the Regional Oral History Office has been interviewing leading participants in or well-placed witnesses to major events in the development of Northern California, the West, and the Nation. Oral history is a modern research technique involving an interviewee and an informed interviewer in spontaneous conversation. The taped record is transcribed, lightly edited for continuity and clarity, and reviewed by the interviewee. The resulting manuscript is typed in final form, indexed, bound with photographs and illustrative materials, and placed in The Bancroft Library at the University of California, Berkeley, and other research collections for scholarly use. Because it is primary material, oral history is not intended to present the final, verified, or complete narrative of events. It is a spoken account, offered by the interviewee in response to questioning, and as such it is reflective, partisan, deeply involved, and irreplaceable.

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It is recommended that this oral history be cited as follows:

> J. Ward Downey, "Mining and Construction Engineer, Industrial Management Consultant, 1936 to the 1990s," an oral history conducted in 1991 by Eleanor Swent, Regional Oral History Office, The Bancroft Library, University of California, Berkeley, 1992.

Copy no. _____

The Press Democrat

December 1, 1992

DOER'S PROFILE

Ward Downey

Job: Engineer (retired) for Del Monte Corporation.

Age: 81.

Home: Santa Rosa.

Personal: Married 17 years to Alberta. "It's the second marriage for both of us." Both are University of California graduates, he in mining engineering, she in history of art. Ward has 2 sons (James and Stephen) and 2 daughters (Catherine and Loretta) by previous marriage, she has daughters Mary and Anne.

Community involvement: In 1985, Downey joined the Executive Service Corps, a group of 130 retired executives and professionals who volunteer their time and experience to non-profit groups that need expertise in finances, marketing, fund-raising, public relations and other management skills. Downey recently was presented an outstanding achievement award from the Executive Service Corps of the San Francisco Bay Area. "There are over 3,000 non-profit groups in the Bay Area and a lot are looking for help. We assist in any way we can," Downey said.

How I got involved with ESC: "I am a great believer in keeping busy when you're retired. Five or six days of golf gets tiresome. I am also on the 1992 Sonoma County Grand Jury and that keeps me busy, too."

Hobbies: Gardening, walking, traveling ('we've been practically every place in the world, so we're just concentrating on seeing the good old U.S.A.")

Fantasy: "Find something else to do. I fantasize about being on a commission or board, just to keep busy. I don't think being 81 is any handicap as you as you can think or get around."

If you have learned one thing in life, what is it? "I've got a real good one for that. No matter how smart or how good a man you are, the most important thing is to be a team player. If they want you to go to Timbuktu, you go. Then you're own your own and it's up to you to do the job right with as little supervision as possible. Too many people resist moving or changing and miss an opportunity."

Three words that best describe me: "I have a lot of initiative...very conservative although my first vote was for Norman Thomas, the Socialist. Finicky about the way things are done. When I was in construction I was a fanatic for cleanliness, not picking up boards with nails, not wearing hardhats. I'm not outgoing; I'm more of an introvert."

— GEORGE HOWER,
Staff Writer

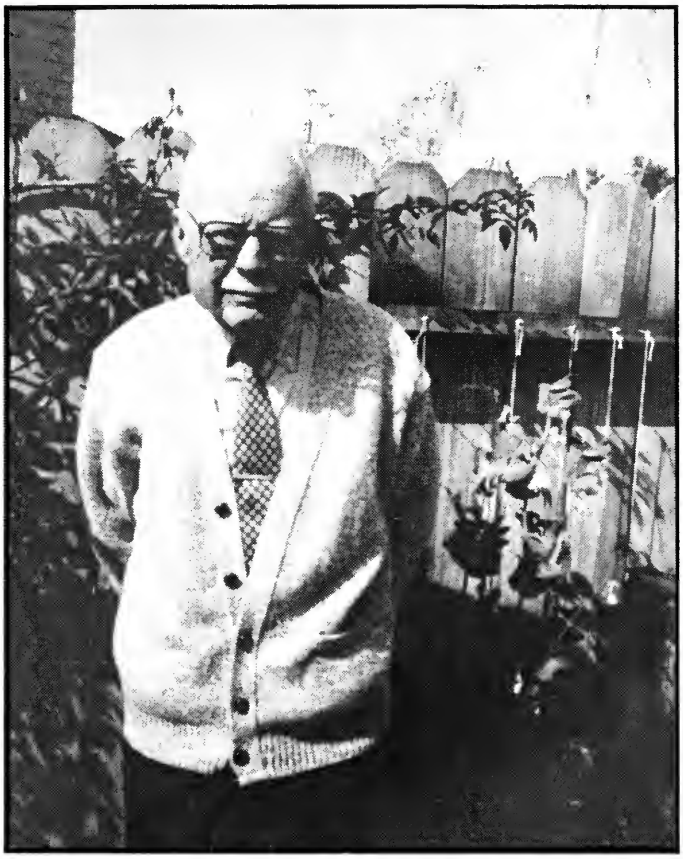
If you know somebody who spends time helping others in our community, please write to Doer's Profile, Features Department, The Press Democrat, P.O. Box 569, Santa Rosa 95402.

The Press Democrat

November 25, 1997

DOWNEY, J. Ward — Died November 21, 1997 in Santa Rosa. He is succeeded by his wife, Alberta, four children and two grandchildren. He was a graduate Mining Engineer from the University of California and worked at the Empire Mine in Grass Valley, a copper mine in Ray, Arizona and a Trona mine in Green River, Wyoming. He was then hired by Del Monte Foods Company and, after retiring, took a position with the International Executive Service Corps in Egypt.

No services will be held. Private interment, Holy Cross Catholic Cemetery, Colma, CA. Arrangements under the direction of DANIELS CHAPEL OF THE ROSES.



J. Ward Downey, 1992

Cataloging information

DOWNEY, J. Ward (b. 1911) Mining engineer

Mining and Construction Engineer, Industrial Management Consultant, 1936 to the 1990s, 1992, xiii, 151 pp.

Education at UC College of Mines, 1929-36; work in Grass Valley, California, area mines during Great Depression, and in mines in Arizona, Idaho, northern California until World War II; engineer, Canol Project; Wyoming trona mine, 1946-1950; construction engineer, Western Knapp, Swinerton and Walberg, Pacific Mechanical engineering companies, various projects, 1952-1965; construction, energy management and conservation, Del Monte Corporation, 1965-1975; International Executive Service Corps, construction advisor, Egyptian sugar refinery, 1981. Includes an autobiographical memoir written by J. Ward Downey.

Introduction by Philip Read Bradley, Jr.

Interviewed in 1991 by Eleanor Swent for Western Mining in the Twentieth Century Oral History Series. The Regional Oral History Office, The Bancroft Library, University of California, Berkeley.

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PREFACE

The oral history series on Western Mining in the Twentieth Century documents the lives of leaders in mining, metallurgy, geology, education in the earth and materials sciences, mining law, and the pertinent government bodies. The field includes metal, non-metal, and industrial minerals, but not petroleum.

Mining has changed greatly in this century: in the technology and technical education; in the organization of corporations; in the perception of the national strategic importance of minerals; in the labor movement; and in consideration of health and environmental effects of mining.

The idea of an oral history series to document these developments in twentieth century mining had been on the drawing board of the Regional Oral History Office for more than twenty years. The project finally got underway on January 25, 1986, when Mrs. Willa Baum, Mr. and Mrs. Philip Bradley, Professor and Mrs. Douglas Fuerstenau, Mr. and Mrs. Clifford Heimbucher, Mrs. Donald McLaughlin, and Mr. and Mrs. Langan Swent met at the Swent home to plan the project, and Professor Fuerstenau agreed to serve as Principal Investigator.

An advisory committee was selected which included representatives from the materials science and mineral engineering faculty and a professor of history of science at the University of California at Berkeley; a professor emeritus of history from the California Institute of Technology; and executives of mining companies.

We note with much regret the death of two members of the original advisory committee, both of whom were very much interested in the project. Rodman Paul, Professor Emeritus of History, California Institute of Technology, sent a hand-written note of encouragement just a few weeks before his death from cancer. Charles Meyer, Professor Emeritus of Geology, University of California at Berkeley, was not only an advisor but was also on the list of people to be interviewed, because of the significance of his recognition of the importance of plate tectonics in the genesis of copper deposits. His death in 1987 ended both roles.

Thanks are due to other members of the advisory committee who have helped in selecting interviewees, suggesting research topics, and raising funds.

Unfortunately, by the time the project was organized several of the original list of interviewees were no longer available and others were in failing health; therefore, arrangements for interviews were begun even without established funding.

The project was presented to the San Francisco section of the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME) on "Old-timers Night," March 10, 1986, when Philip Read Bradley, Jr., was the speaker. This section and the Southern California section provided initial funding and organizational sponsorship.

The Northern and Southern California sections of the Woman's Auxiliary to the AIME (WAAIME), the California Mining Association, and the Mining and Metallurgical Society of America (MMSA) were early supporters. Several alumni of the University of California College of Engineering donated in response to a letter from Professor James Evans, the chairman of the Department of Materials Science and Mineral Engineering. Other individual and corporate donors are listed in the volumes. The project is ongoing, and funds continue to be sought.

Some members of the AIME, WAAIME, and MMSA have been particularly helpful: Ray Beebe, Katherine Bradley, Henry Colen, Ward Downey, David Huggins, John Kiely, Noel Kirshenbaum, and Cole McFarland.

The first five interviewees were all born in 1904 or earlier. Horace Albright, mining lawyer and president of United States Potash Company, was ninety-six years old when interviewed. Although brief, this interview will add another dimension to the many publications about a man known primarily as a conservationist.

James Boyd was director of the industry division of the military government of Germany after World War II, director of the U.S. Bureau of Mines, dean of the Colorado School of Mines, vice president of Kennecott Copper Corporation, president of Copper Range, and executive director of the National Commission on Materials Policy. He had reviewed the transcript of his lengthy oral history just before his death in November, 1987. In 1990, he was inducted into the National Mining Hall of Fame, Leadville, Colorado.

Philip Bradley, Jr., mining engineer, was a member of the California Mining Board for thirty-two years, most of them as chairman. He also founded the parent organization of the California Mining Association, as well as the Western Governors Mining Advisory Council. His uncle, Frederick Worthen Bradley, who figures in the oral history, was in the first group inducted into the National Mining Hall of Fame, Leadville, Colorado, in 1988.

Frank McQuiston, metallurgist, vice president of Newmont Mining Corporation, died before his oral history was complete; thirteen hours of taped interviews with him were supplemented by three hours with his friend and associate, Robert Shoemaker.

Gordon Oakeshott, geologist, was president of the National Association of Geology Teachers and chief of the California Division of Mines and Geology.

These oral histories establish the framework for the series; subsequent oral histories amplify the basic themes.

Future researchers will turn to these oral histories to learn how decisions were made which led to changes in mining engineering education, corporate structures, and technology, as well as public policy regarding minerals. In addition, the interviews stimulate the deposit, by interviewees and others, of a number of documents, photographs, memoirs, and other materials related to twentieth century mining in the West. This collection is being added to The Bancroft Library's extensive holdings.

The Regional Oral History Office is under the direction of Willa Baum, division head, and under the administrative direction of The Bancroft Library.

Interviews were conducted by Malca Chall and Eleanor Swent.

Willa K. Baum, Division Head
Regional Oral History Office

Eleanor Swent, Project Director
Western Mining in the Twentieth
Century Series

October 1990
Regional Oral History Office
University of California, Berkeley

Western Mining in the Twentieth Century Oral History Series
Interviews Completed, July 1992

Horace Albright, Mining Lawyer and Executive, U.S. Potash Company, U.S. Borax, 1933-1962, 1989

James Boyd, Minerals and Critical Materials Management: Military and Government Administrator and Mining Executive, 1941-1987, 1988

Philip Read Bradley, Jr., A Mining Engineer in Alaska, Canada, the Western United States, Latin America, and Southeast Asia, 1988

Catherine C. Campbell, Ian and Catherine Campbell, Geologists: Teaching, Government Service, Editing, 1989

James T. Curry, Sr., Metallurgist for Empire Star Mine and Newmont Exploration, 1932-1955; Plant Manager for Calaveras Cement Company, 1956-1975, 1990

J. Ward Downey, Mining and Construction Engineer, Industrial Management Consultant, 1936 to the 1990s, 1992

James Mack Gerstley, Executive, U.S. Borax and Chemical Corporation; Trustee, Pomona College; Civic Leader, San Francisco Asian Art Museum, 1991

John F. Havard, Mining Engineer and Executive, 1935-1981, 1992

George Heikes, Mining Geologist on Four Continents, 1924-1974, 1992

Helen R. Henshaw, Recollections of Life with Paul Henshaw: Latin America, Homestake Mining Company, 1988

Lewis L. Huelsdonk, Manager of Gold and Chrome Mines, Spokesman for Gold Mining, 1935-1974, 1988

Arthur I. Johnson, Mining and Metallurgical Engineer in the Black Hills: Pegmatites and Rare Minerals, 1922 to the 1990s, 1990

Evan Just, Geologist: Engineering and Mining Journal, Marshall Plan, Cyprus Mines Corporation, and Stanford University, 1922-1980, 1989

Plato Malozemoff, A Life in Mining: Siberia to Chairman of Newmont Mining Corporation, 1909-1985, 1990

James and Malcolm McPherson, Brothers in Mining, 1992

Frank Woods McQuiston, Jr., Metallurgist for Newmont Mining Corporation and U.S. Atomic Energy Commission, 1934-1982, 1989

Gordon B. Oakeshott, The California Division of Mines and Geology, 1948-1974, 1988

Vincent D. Perry, A Half Century as Mining and Exploration Geologist with the Anaconda Company, 1991

Carl Randolph, Research Manager to President, United States Borax and Chemical Corporation, 1957-1986, 1992

James V. Thompson, Mining and Metallurgical Engineer; the Philippine Islands; Dorr, Humphreys, Kaiser Engineers Companies; 1940-1990s, 1992

Interviews In Process, July 1992

Samuel S. Arentz, Jr. (Escalante Mine), in process

Donald Dickey (Oriental Mine), in process

H. S. Pete Fowler (Kaiser), in process

Wayne Hazen (metallurgy), in process

James Jensen (metallurgy), in process

John Livermore (geologist), in process

John Reed (rock mechanics), in process

Joseph Rosenblatt (EIMCO), in process

Eugene Smith (U.S. Borax), in process

Langan Swent (San Luis, Homestake, uranium mining), in process

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* Deceased during the period of the project

The Regional Oral History Office
would like to express its thanks to the organizations
and individuals whose encouragement and support have made possible
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INTRODUCTION--by Philip R. Bradley, Jr.

Ward Downey had to draw out his college education, but his subsequent career has turned out extremely well. It clearly exemplifies, for one thing, the way in which a mining education and mining experience so well fit a man for work in other fields of engineering.

The miner is forced to be innovative, open minded, and flexible, all qualities of great value in other fields, especially in those of engineering. Mining so often requires that plans for work made yesterday be drastically changed or even dropped today, as when for instance a crosscut is found to have failed in search for a pay streak indicated elsewhere in the mine to exist; or when even a main drift must be abandoned because of failure in ore value, and different work quickly substituted; or when crew men fail to show for work; or needed mining supplies are not delivered on time. In addition, the miner is often faced with sudden repair jobs and must be, anyway, a naturally good mechanic.

The miner works very closely with, and often against, nature (for which he develops a great respect) and so learns a very great deal about accommodating it.

Such concepts are very valuable in many engineering and even business situations, though the world is filled with people without the first-hand exposure to them which Ward so clearly has had.

In spite of a wide success in fields beyond mining, Ward Downey maintains a close interest in mining affairs. He filled the bill very nicely a few years ago when the University of California Engineering Alumni Association needed a good man as chairman. He took that job for the usual year, and in that short time made a strong contribution.

Philip Read Bradley, Jr.
Former chairman, California Mining Board

June 1992
Walnut Creek, California

INTERVIEW HISTORY--J. Ward Downey

J. Ward Downey's career is representative of his generation: those who struggled for education during the Depression, did military service during World War II, and subsequently shifted course because of changing economic conditions. His fundamental training in mining engineering has enabled him to work successfully at a great many different jobs, under all sorts of conditions, and adjust to the changes in times.

Mr. Downey entered the University of California College of Mines in 1929 and graduated in 1936. During those years, he spent all his vacations and some entire college terms working in the gold mines around Grass Valley, California. The conditions he recalls were harsh, but lasting friendships resulted. After graduation, he worked as a mining engineer in Arizona, Idaho, and other areas of California until World War II. For a time he shifted into tunneling for Pacific Gas and Electric Company. He worked first as mining engineer and then as a construction engineer on the defense-related Canol Project in Canada, before enlisting in the navy.

After the war he resumed mining, in Wyoming, but turned to construction engineering in 1950 when the mining industry offered diminished opportunities. He spent several years doing a variety of engineering work with three different companies before joining Del Monte Corporation. He was there when the oil crisis of 1973 forced another change, and he became director of energy management and conservation for Del Monte. Now in retirement, he continues to use his engineering skills as a volunteer and consultant with the International Executive Service Corps; one such assignment was to advise on construction of a sugar refinery in Egypt.

Mr. Downey is a native Californian with a keen appreciation for the history of mining. He was one of the first University of California alumni to respond when the oral history series on Western Mining in the Twentieth Century was announced. He contributed his own two delightful written memoirs to The Bancroft Library archives, as well as a copy of "Mining Experiences, 1932-1985," the memoirs of his friend Allan Harris James.

A letter inviting Ward Downey to be interviewed was sent on 18 October 1991. A planning session was held at The Bancroft Library on 3 December, and it was decided to expand on his written memoir rather than re-recording his whole career. A single substantial interview was conducted on 6 December 1991 at my home in Piedmont. The transcript of this interview and portions of Mr. Downey's written memoirs comprise this volume. In his written memoir, "Mucker, Miner and Mule Skinner," Mr. Downey speaks in detail of the mining equipment and practices he observed

while working for the Empire and Idaho-Maryland mines in the Grass Valley area during the 1930s. He also traces his subsequent career as mining and construction engineer. The oral interview adds tributes to some of the well-known mining men he knew, and additional information on the working conditions which led to his decision to leave the mining field. The tapes of the interview are available for study at The Bancroft Library.

At the interview, Mr. Downey was gracious as always, and came well prepared, with notes at hand for reference when necessary. When the transcript was sent to him for review, he made a few changes and returned it promptly.

The introduction to the oral history was written by Philip Read Bradley, Jr., a 1926 graduate of the California College of Mines and for many years chairman of the California Mining Advisory Board.

Mr. Downey has donated significant annual gifts and a generous deferred bequest to the mining series fund. He has also been a wise advisor, with the cooperation of his wife, Alberta.

Eleanor Swent, Project Director
Western Mining in the Twentieth
Century series

May 1992
Regional Oral History Office
The Bancroft Library
University of California, Berkeley

Regional Oral History Office
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University of California
Berkeley, California 94720

BIOGRAPHICAL INFORMATION

(Please write clearly. Use black ink.)

Your full name JAMES WARD DOWNEY

Date of birth SEPT 1, 1911 Birthplace SEATTLE, WN.

Father's full name JAMES CORNELIUS DOWNEY

Occupation DECEASED Birthplace LACROSSE, WIS.

Mother's full name LORETTA MAUD DOWNEY

Occupation DECEASED Birthplace SAN FRANCISCO, CA

Your spouse ALBERTA P. DOWNEY

Your children JAMES, STEPHEN, LORETTA, CATHERINE

Where did you grow up? SEATTLE AND SAN FRANCISCO

Present community SANTA ROSA, CA

Education B.S. MINING, UNIV. OF CALIFORNIA, BERKELEY
MBA, UNIVERSITY OF SAN FRANCISCO

Occupation(s) WORK WITH NON-PROFIT ORGANIZATIONS
CURRENTLY MEMBER SONOMA COUNTY GRAND JURY

Areas of expertise ENERGY CONSERVATION, CONSTRUCTION MANAGEMENT, FEASIBILITY STUDIES, REPORT WRITING

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Organizations in which you are active EXECUTIVE SERVICE CORPS, U.C. ENGINEERING ALUMNI SOCIETY, ORAL HISTORY ADVISORY COMMITTEE, BANCROFT LIBRARY.

RÉSUMÉ

J. Ward Downey
1135 North Street
Santa Rosa, CA. 95404 Tel. (707) 575-0660

MAJOR WORK EXPERIENCE

1976 to present

INDUSTRIAL MANAGEMENT CONSULTANT : Performing energy audits and establishing energy conservation programs for government agencies and private industry; material handling systems design; mine examinations and feasibility reports; setting up controls for engineering, procurement and inspection for large sugar beet plant in Egypt; developing policies, procedures and financial plans for small businesses.

1965 to 1976

DEL MONTE CORPORATION: Director of Energy Management and Conservation for world-wide operations (1973-1976) Prior to that, had responsibility for design and construction of food processing plants, office buildings, warehouses, research facilities for company's U.S. operations as Chief Engineer of Construction.

1960 to 1965

PACIFIC MECHANICAL CORPORATION : Vice President, new business development for medium sized Mechanical Contractor. Responsible for estimating and project coordination on pulp and paper mills, chemical plants, oil refineries and mining and milling facilities in western U.S.

1955 to 1960

SWINERTON AND WALBERG INC : Principal Mechanical estimator for all types of chemical, petroleum, rocket installations, uranium reduction plants and steam power plants throughout the western U.S.

1952 to 1955

WESTERN KNAPP ENGINEERING COMPANY : Project Manager, resposible for design, estimating and field supervision on ore processing plants, floatation mills, exploratory shafts and mine development in U.S., Canada and Mexicao.

OTHER WORK EXPERIENCE

Mine Superintendent during development and production for the first Trona project in Wyoming, 1946 to 1950 .

Project Manager for a major expansion of a magnesium treatment plant in California , 1950 to 1952 .

EDUCATION

B.S. Mining Engineering, University of California, 1936
MBA, University of San Francisco, 1968
Registered Professional Engineer-Metallurgy

I SOME MEMORABLE MINING MEN IN THE 1930'S

[Interview 1: December 6, 1991]##

Swent: Mr. Downey, you have written such a wonderful memoir of your early schooling and your years at Berkeley and the time you spent working up at the Empire that we don't need to go into a great deal of detail on those parts of your career.

Downey: No. That's right.

Swent: But there were a couple of people about whom you didn't go into detail. You might mention them now.

Fred Searls, Executive Vice President of Newmont Mining Company

Downey: That's right. I would like to talk a little bit about Fred Searls. He was a wonderful, wonderful person. People who had worked with him whom I have known--this is Newmont Mining--said that they thought he was one of the greatest mining engineers ever to walk down the pike.

He was one of five boys in the Searls family and every one of them became well known in the professions: doctors, lawyers, engineers. I guess they were all very humble, because I took a course in public speaking at the University of California evening school, one of the times I was living in San Francisco, and Dr. Searls was in the class. He was a wonderful person but he could never talk looking at the class. He always talked looking down at his feet. He wanted to learn how to speak. It was amazing how good he became after a course in public speaking. There was a wonderful woman who taught at the extension. So I got to know him really well and of course--.

Swent: What was her name?

Downey: Golly, I can't think of her name. But she was awfully good. She was just a fabulous teacher. I got more out of that course, I think, than any night school I ever took.

Swent: This was Fred's brother?

Downey: Fred's brother, that's right. Fred was, as I know, very humble too. One time, a friend of mine asked him why he didn't write his memoirs. He had done so much in mining and done some all over the globe in mining. He said, "I haven't done anything good. Nobody would want to read about that. In fact, some of the things I did I'm not too proud of. I wouldn't want to put them down." So he was that type of a person.

Allan James, Mining Engineer

Downey: Then Allan James was another cut of individual. Allan was a very, you might say, prissy type. He didn't like anybody to swear around him. He never swore. I never saw him take a drink. I had run into so many young mining engineers and students who were just the opposite of that. They usually liked a good party and didn't care what they said. Allan was entirely different. I had never met anybody like that before. But he was smart, had a good head on him.

Swent: How did you know him? What was your connection with him?

Downey: When I first went up to Grass Valley, I had twenty dollars. I was completely broke when I finally got hired after three weeks of rustling a job. I had met Allan. I don't remember how I met him, but he was working underground at the Empire Mine. He loaned me the money to buy all my clothes so that I could work underground. It was very kind of him. He had an apartment down in Grass Valley so he said, "Why don't you come and live with me and we'll share costs." That was fine.

Before very long there were three others who showed up. One from Stanford, Roger Kirkpatrick, who later became very well known in the USGS [United States Geological Survey], and a fellow from Cal, Bill Schwartz.

Allan ran into a fellow one time sitting on a bench in the park. He got talking to him and he found out he was a mining engineer from Minnesota; he was dead broke. He was sleeping on the bench at night, covered with papers; he couldn't get a job. So Allan said, "Well, come and live with us." So Allan brought him in. We fed him and got him back on his feet. I don't

remember. He finally got a job somewhere. But that was Allan for you. He was kind of a very good-hearted fellow.

Then I didn't see him again, I guess, not until 1976. I met him at a mining convention in Salt Lake City. Then of course he died a few years afterwards. I enjoyed thoroughly reading his memoirs because I could see him, the way he talked about his problems with people. He was very different. He had different ideas. Much like I was, I guess. We were very much the same. We were the same age.

So those two people I can remember very fondly from Grass Valley.

Swent: How did you know Fred Searls?

Downey: Just because I was working at Newmont's Empire Mine and he came underground one day with Fred Nobs, the mine manager. I was working on a contract on the 3,000-foot level. He came along and introduced himself. We sat in the muckpile and talked. He asked me what I was going to do when I got back to school. I told him and he said, "Well, you could do worse than coming to work for Newmont."

Unfortunately, I was never able to latch on with Newmont after I graduated. They didn't have any engineering work. So I never was able to take up on his invitation. Maybe I should have tried harder.

Swent: He was at that time already the president?

Downey: He was executive vice-president and very, very good. The people who stayed with him like Frank McQuiston and Plato Malozemoff rose up really fast under him because he gave people a lot of opportunity to show their abilities. In other words he didn't look over their shoulder. He would give them a job, and say, "Go out and do it." Those two fellows did that and they were very successful at Newmont.

Bert Austin, Consulting Mining Engineer

Downey: Then after I graduated from the school, from Berkeley, in 1936, I was fortunate enough to hear about a job in San Francisco with Bert Austin, a very well-known consulting mining engineer. He was looking for a young fellow like I was to do some mapping and some sampling and surveying. It was about five months I worked with him and learned an awful lot of good, practical mining expertise.

Swent: Did he go out with you?

Downey: He would go out with me oftentimes and we would go look at a mine somewhere up in the Sierras. He would then leave me there to do sampling and do some mapping. I learned how to use a Brunton compass finally. In those days, all the mapping was done on hard paper, like butcher paper. Very stiff, and then it had to be traced. It was hard to do a good job, but I learned an awful lot about doing that kind of work for him.

Then he had a lot of very interesting friends. I remembered old-timers who would come in from Nevada or all over the place to sit and talk with him. One old guy had been up in Alaska in the '98 gold rush and he came back to civilization with $100,000 in money made on the gold rush in Alaska. He gave $50,000 to his mother and he took $50,000 and bought a race horse. Well, his mother did pretty well, but he lost all his money on the race horse. So he had to go back and work in the mines in Nevada. Bert Austin used to kid him about his race horse.

One time, there was another friend of his who was doing a diamond drilling job at the Harvard Mine near Jamestown. He was looking for an engineer so Bert Austin sent me out there to work with him. It was a month, or six weeks, where they diamond drilled the old Harvard Mine. My job was to split the cores and take them to the assayer and make logs of everything that came out. That was the basis of the reopening of the Harvard Mine recently. Those diamond drill cores evidently found enough values in the hanging and foot walls to make it worthwhile for the Bradleys to make an open pit out of it. So that was interesting. I learned a lot about diamond drilling.

Swent: Who was the diamond driller? Do you remember?

Downey: His name was Weller. George Weller. That's all I know about him. I guess he was just a contractor who did the work. He was good. He had a g od reputation.

Swent: I'm surprised that you hadn't used the Brunton compass in any of your work at college.

Downey: I couldn't even afford to buy one.

Swent: And they didn't have them for you to practice?

Downey: No, I didn't know how to use one at all. Those who were wealthy had them--the geologists. Of course, we never were required to have one in mining. On geology trips, I borrowed one from a friend. We learned to do underground surveying in the old Lawson

adit. But a Brunton compass--I didn't know how to use one for surveying until I got out of school. It's a very wonderful tool. I did a lot of surveying with it afterwards.

Just like Smolley's Tables. We never even heard of Smolley's Tables in school. We used to have to figure out all the angles and the lengths when you're designing any kind of piece of steel, anything on the size. You get a book called Smolley's Tables and it's got it all in there. But they didn't tell us about that in school.

They wanted us to figure it all out just like using nine-place logarithms to close on a transit survey in a civil engineering summer class. That was a laborious thing to use, a nine-place logarithm. I don't think anybody could find a book of nine-place logarithms now, except maybe in an antique store. Things have changed tremendously.

Henry Gould, Consulting Mining Engineer, Expert on Mercury

Downey: Henry Gould was another well-known mining consulting engineer. I don't think Henry ever went to college. I think he came up through the ranks and learned it all himself and made himself a top consulting engineer in mercury (quicksilver) mining. He had developed the quicksilver mining out of San Jose.

Swent: New Almaden?

Downey: New Almaden, right.

Swent: He owned it, didn't he?

Downey: He owned it, right. He had a boy named Gordon who had graduated from Berkeley in the early thirties. Gordon was down there running the show. He wanted some help so Henry Gould sent me down there to help Gordon out and do some work. Oh, boy, talk about an isolated spot. I had to live with a Mexican family. Morning, noon, and night we had Mexican food. It didn't agree with me at all. I stayed there maybe a month or six weeks. I told Gordon I thought I would move on.

One day I was doing some mapping in Henry Gould's office prior to going to the mercury mine to work and Herbert Hoover came in, accompanied by two husky guards. He was still being threatened in 1936 for causing the 1932 Depression. Hoover had interests in quicksilver properties in Central America and Gould

was his consultant. That's the closest I ever got to a president or an ex-president.

II A JUNIOR ENGINEER, RAY, ARIZONA, 1937

Downey: Then that's when I went down to Ray, Arizona, in the beginning of 1937. Dean Frank Probert, the dean of mining at Berkeley, had worked for the English company that first developed the copper deposit at Ray, Ray Consolidated. He used to talk about it so I thought that would be a good place to try out. I was lucky; they hired me as a junior engineer. It was like a whole new world in mining. I had never seen such big production. There were thousands and thousands a ton a day of this ore, and there were shrinkage stopes and big haulage ways. It was so much bigger and different than Grass Valley, with their mules and the manpower and archaic ways.

The people were entirely different. They were not provincial at all. They were very friendly and open. They weren't like the Cousin Jacks who looked askance at you if you weren't from Cornwall when you would go to Grass Valley. They were just a lot of fun. I enjoyed the people down there and I enjoyed the job. There were a lot of young engineers working there.

Swent: This was copper.

Downey: This was copper, right. In fact, I got quite friendly with the general manager's daughter. Her parents were very good to me. They used to take us to Phoenix every once in a while to a show and dinner.

Swent: Who was that?

Downey: The manager's name was Robert Thomas. A very interesting fellow, he played beautiful piano. He used to love to play the piano; gosh, he was just great. I heard a story one time about him, that he had been down in Mexico in one of the copper camps down there and wasn't able to get a job just after he got out of school. So he got a job playing the piano in a nightclub in the town. One night, there was a party of mine officials there at the night club. They got talking to him, found out that he was a mining

engineer and couldn't find a job. Lo and behold, they had a job for him. So they gave him a good job just because they liked his piano playing. I guess that was his start with Kennecott.

I toyed with the idea of staying but everybody ahead of me was pretty young. It didn't look like there was much chance to move ahead. I suppose I should have listened to Cooley Butler's admonition to seniors at Columbia, "Become a snob and marry the general manager's daughter." But that didn't work out.

III HUNTING FOR A GOOD ENGINEERING JOB DURING THE GREAT DEPRESSION

Downey: So I came back to San Francisco and did a few little jobs with Bert Austin again and that petered out. So I went up to the Mother Lode and stopped in at Jackson and at the mines along the Mother Lode, and there was no work for mining engineers at that time. Things were pretty tough in the established mines.

Swent: When was this?

Stoper for Idaho-Maryland, Grass Valley, California

Downey: Towards the end of 1937. So I ended up in Grass Valley and there was no work there. So after checking the Empire, I went over to the Idaho-Maryland and thought maybe I could get a job there. Well, they didn't have any work for an engineer but they asked me, could I run a drill? I could run a drill. I had done that a lot at the Empire, so, okay. Going up to this new mine, this little prospect they were starting up there, near Washington. John Tolman was running it. I had met John in Grass Valley. He had been working for Idaho-Maryland. In fact, we stayed at the same boarding house when I was up there one Christmas. So I said, "Okay." I went up there.

They showed me where I was going to work. It was just maybe a three- or four-hundred-feet-deep prospect. It was the wettest thing I ever saw in my life. They gave me a stoper in this awful place to work, water driving down; I was soaking wet and I hadn't been there a half hour. It was a terrible place to work. I said, "Well, boy. I guess this is it. No engineering jobs."

I had been there a week or two when one night, the compressor wheel on the big air compressor flew off its mounting and went right through the roof of the compressor house and rolled

down the mountainside. Boy, when I heard that and found out the next day I said, "This is it." So I took off. I said, "Enough of that place." I don't know if they ever got it going again or not. But John was a nice guy. He was a geologist and I don't think he knew too much about running a mine.

Speaking of the Idaho-Maryland reminds me of an anecdote about Errol MacBoyle, the head honcho when I worked in Grass Valley. The Whitney family from the East Coast re-opened the mine in the 1920s but didn't find much ore despite spending a wad of dough on the mill and looking for the vein extension. MacBoyle was mine superintendent and after the Whitneys gave up, he took over the lease and pretty soon found the rich vein, making it a big winner. A lot of locals thought MacBoyle knew where the ore was all the time. He was a Cal man but for some reason always hired Stanford grads as engineers.

Swent: When you went to work for one of these places, what were the mechanics of getting a job? Did you sign any kind of paper?

Downey: No. You just filled out an application blank. If they had anything for you, fine. As I said, the mining engineering jobs were just scarce, few and far between.

Swent: There were no benefits whatsoever?

Downey: No benefits. No, you just went to work and got paid so much a day.

Swent: How much would you be paid? At Ray, for example, how much did you make?

Downey: I made $125 a month salary at Ray.

Swent: And then you were paying at a boarding house?

Downey: A boarding house, so you never got too far ahead. In mining camps, things were pretty expensive. I remember in Grass Valley, I made three dollars and a half or so a day. The board and room and your transportation and your clothing and what not practically used up everything that you would get. The only way you could get out of it was to be lucky enough to be put on a contract, which I did when I was there finally. I got ten dollars a day. That was good money. That was good money so I was able to save enough so I could go back to school. I never would have come back if I would have had to stay on at a miner's or a mucker's wage. It was just very expensive.

Swent: Was there any kind of health care as there is now?

Downey: Not a thing.

Swent: What happened if there was an accident?

Downey: That's all you got, under the state compensation. That was still in effect then. But as far as the company having any benefits there were none at all. They had kind of a weak union at Grass Valley but that didn't seem to do much for the men. It was more of a social thing. The young engineers never joined it. We weren't asked to join or forced to join, which was good. It was the same thing at Ray. You just worked and if you were lucky you didn't get hurt. If you lived long enough, I guess you might have gotten a retirement. But they never talked about a retirement in those days. I remember the first paycheck I got at Ray. They took out thirty cents for Social Security.

Swent: That was the beginning of that.

Downey: That was the beginning of Social Security in 1937. In fact, I still have the stub. I saved it.

Swent: So you theoretically were supposed to be saving some money then to see you through these times when you didn't have a job. If you didn't have enough--.

Downey: I don't know how people who were married managed it. I guess probably the only alternative was to go foreign. They paid a little better and of course you got your housing and your transportation to a foreign job. I wasn't married so I didn't need to go to a foreign job.

Assayer for Bunker Hill and Sullivan, Idaho

Downey: So then the next stop was, "Well, I'll try another place where there is a Cal graduate, Stanley Eastman, managing." That was Bunker Hill and Sullivan. Then again I lucked into a job.

Swent: This was in Idaho?

Downey: In Kellogg, Idaho. I took the train. Again I lucked out. They were looking for an engineer to go to a prospect in Central Idaho near that "river of no return." I never can remember the name of it. It is a very isolated place, almost the end of the line. I think Dixie, Idaho, is the last town. From then on, they took you on a truck to the mine. It was an interesting experience because

again they had very primitive tools, stuff that was used, second-hand. Everything was second-hand. Everything had to be trucked in.

I was an assayer. Well, I had never done any assaying except in school. Luckily I had my assay book with me. I managed to get the assays done. I had to do the sampling and then crush the samples in a buckboard. They didn't have any motors, any laboratory grinders. Then I had to take the samples and then do the assays. I must have been pretty good because the manager of the mine, a sour, dour old Englishman, I don't think he trusted me, so he had all my samples checked. I never had one come back that was wrong. I felt pretty good about that.

But I didn't want to become an assayer; I thought that was not much fun. So I stayed there until the following spring, after the snow had melted, and then the company decided there wasn't enough gold there to keep going so they closed it down. So I went back down to Kellogg.

Disappointment at Buffalo Hump, Idaho

Downey: They didn't have anything else for me and I was about to come home when I heard about a fellow named Walter Remer, who had a lease on some property up not too far from Dixie where I was. So I talked to him and he seemed to think that I could fit into his organization. He couldn't pay me anything but he said, "Well, if we make this mine go, you'll be part of the big payoff." It was being financed by his brother-in-law, a bakery owner in Lewiston, Idaho.

Remer was a very charismatic person, golly, a good-looking guy. He had done a lot of interesting things. He had been a flyer and had been flying supplies to Amundsen on his dash to the North Pole. Afterwards, I found out that he had also been flying liquor from Canada into Seattle. He was almost caught by the federal agents one time. They shot at him in his plane as he took off. They put holes in it but they never caught him. He was a very religious person. He went to church regularly. So I kind of was taken in by him.

We got up there to this place called Buffalo Hump. It was far more isolated than I had been at Dixie. It was an old mining camp and there were some remnants of a hotel there that were in pretty good shape; they were still pretty good. So that's where we had our headquarters. They brought these other people in on

the same deal I was to do the mining: you get paid when the returns come in. They leased a mill to run the ore through when they got enough stockpiled in Elk City about thirty miles away. They finally got enough ore to haul down to Elk City and then I went down there to do the assaying and help run the mill.

The stuff was extremely rich but the gold was hard to get out of it, mostly sulfides--. The old-timers had never been able to get the gold out with their stamp mills and mercury plates. That's why they had abandoned it in 1898 and gone to Alaska. The new methods of milling, the jigs and the flotation cells, were able to get the good high-grade stuff. So we shipped it to a smelter. Then we found out it was so high in arsenic and other metals that there was a set penalty on it. Very little money was recovered from this operation. So I decided that wasn't going to be a great future so I left and came home.

Then I was getting pretty discouraged in mining. It didn't look as if I was going to find anything in this country. I still didn't want to go foreign. My mother wasn't well at the time. She was alone--my father had died--and I didn't feel like leaving her. So I went in to see Bert Austin again. He said Henry Carlisle, another well-known mining engineer, was a consultant for a mine on the Feather River called the Virgilia Mine.

Engineer at the Virgilia Mine, Feather River, California

Downey: They were looking for an engineer. So I took off, took the train and went up to Virgilia. It's on the Feather River. It was pretty well developed. It had been an old mine that was then reopened. There were some very good values in the upper stopes that had never been really taken out. They were mining that and doing pretty well. They decided to sink a shaft. They had built a mill, pretty much of used equipment, like most mills were in those days.

The fellow who was running it was George Potter. He was a mechanic really by trade. He wasn't a mine man. But I guess they put him in charge because they figured there would be lots of breakdowns and that there were. He was never happier than when there was something broken down in the mill. He would just go in there and fix it. There would be three or four guys standing around handing him tools. In the meantime, there was nobody doing the book work in the office and nobody looking around the whole property. So naturally the thing didn't last very long.

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Downey: I was doing engineering and I was also an assistant foreman. I worked with an old-time mining man. I learned a lot from him. He was good. We got along real well. But then that petered out.

Swent: When you said that the book work was neglected, what do you mean?

Downey: Well, a mine manager has to know accounting. He has to check the books. He has to know his costs. He has to know what everybody is doing; he has to keep everybody on the job. Are supplies coming in? Are we going to have enough to keep us going in the winter? How about the boarding house? Are people happy in the boarding house? There was just a myriad of things to know about besides making sure the mills are running. I often said, and I have heard this said many times, you take a good journeyman and make him a superintendent, you end up losing a good journeyman and getting a bum superintendent. That was, in that case, so apparent.

Swent: As engineer, what were you doing?

Downey: I was doing surveying. Then I used to walk the mine every morning with this foreman and he would tell me what was going on, tell me where he wanted some samples taken and what surveying needed to be done. That irked me too because I was getting, I don't know, three dollars an hour, maybe something like that. When I needed to do surveying, I had to take the mine carpenter and he was getting five dollars an hour. He was holding the rod for me while I was surveying and he was getting two dollars more an hour.

I was working seven days a week, no time off, nothing. People just don't realize how tough things were for engineers in those days. I think a lot of engineers I know, highly educated, worked as muckers in the underground. It just wasn't possible to get an engineering job in those times.

Tunnel Engineer for Pacific Gas and Electric Company

Downey: Well anyway, I saw that PG&E [Pacific Gas and Electric] was starting to move into Feather River to build a couple of dams and build tunnels. So I got the idea, well, maybe I'll go work for PG&E as a tunnel engineer. So I went back to San Francisco and they hired me in the engineering office, testing me out, I guess. I worked there for a while and then I told them that I would like

to go into construction and be on the tunnel job up there in the Feather River.

So they sent me up there. That was fine. I enjoyed that. I enjoyed doing the surveying work in the tunnel. It was these great big twenty-foot-diameter tunnels. It was hard rock; it looked like a good job with an excellent boarding house and I liked the fellow engineers and everybody else.

My boss was a Yale graduate named George Thacher--his family operated the Thacher School at Ojai--he was a real good guy to work for. He refused to work for PG&E during the Depression as a meter reader in Chinatown three days a week. He went to work in a gold mine as a mucker, don't remember which mine. When things got better, he latched onto PG&E again and worked in construction until retiring.

Lo and behold, the government came in and said, "You can't build on this property because the dam, when it's filled--the water--will be on federal property. We aren't going to let you build it." This was during Roosevelt's time, and the secretary of the interior, Harold Ickes, didn't like utilities. That was it. We had to move off, stop everything, pull everything out, and move the whole kit and caboodle to the Pit River.

That was like going from day to night. They had no facilities up there. There was no place to live. It was real primitive. The company had taken over a summer camp that fishermen had used. There was no hot water, nothing. We had to bathe in the Pit River. It was really something. I said, "Well, things will get better. They will build some facilities for us," and they did.

Then I got married at that time. So I wanted a house. The PG&E people said, "We can't give you a house because you weren't married when you came to work for us."

I said, "Well, that ends that."

IV WORLD WAR II: ENGINEER FOR CANOL PROJECT, CANADA

Downey: About that time, the Japs bombed Pearl Harbor, and my bride was in San Francisco. I decided that I had better not stay up there. So I went back to San Francisco.

Swent: You were up there at the Pit River?

Downey: Yes, I was up there at the Pit River. I remember it vividly. I was standing in front of the PG&E office there and some guy came rushing out and said, "The Japs have bombed Pearl Harbor."

I said, "Oh my gosh." Then we got more and more reports. Then there was talk that they were going to invade Hawaii and maybe invade the Pacific Coast. That was enough to scare me to death, so I asked for a transfer back to San Francisco. They gave me a transfer back in the engineering office in San Francisco. I worked there for a while. I also worked a number of other jobs in engineering in San Francisco later on.

In the meantime the draft board was starting to breathe heavily down my neck because I had been classified 1A. I hadn't been married when the draft was started. So they told me, "If you don't get into some necessary work, where you can get deferred, we are going to have to draft you." Because this draft board I was in was heavily filled with minorities. It was in an area in San Francisco where there were a lot of minorities. They were getting desperate to get whites drafted so I thought, "Oh-oh."

So I read that they were hiring engineers to take to Canada and Alaska on the Canol oil project. I went down to the office; they looked my record over and said, "This is interesting because we've also been assigned to study the coal reserves in Alaska in case something happens. If the Japs bomb the oil fields and we don't have any oil, we might want to develop the coal."

So they sent me up there as a mining engineer to look at the coal fields, the possibility of developing the coal.

Swent: Who sent you?

Downey: This was an engineering firm from St. Louis called Turnbull Sverdrup and Parcel. They had the engineering contract to do all the design work for the pipelines, for the pump houses and all the auxiliaries for the whole job. I was hired by them. It turned out that they decided after a while that they weren't too interested in the coal so they put me in charge of building pump houses and watching the welding on the pipeline. I got to see an awful lot of Canada and Alaska.

Swent: Did that pay pretty well?

Downey: Yes, that paid really well because all my room and board was paid. I didn't have to pay anything. They had PXs [post exchanges] where you could buy the stuff just like the GIs could buy at the PXs for practically nothing. That was good. I was putting aside some money for the first time in my life really. My wife was in San Francisco.

Then who should show up one day but Senator Truman. He was on some committee investigating this thing. They had heard about all the waste on this Canol project. By that time, the Japs were starting to look like they weren't going be able to get up there. They had lost the battle of Midway and what not. So he came to see why they were spending all this money on building this refinery and bringing all these oil lines from the Mackenzie River over to White Horse, in the Yukon Territory.

He was there for a while. Then he went back to Washington to report that they ought to shut the thing down. The story was that the army and the Pentagon and the rest of the people in Washington, D.C., persuaded the powers that be in the administration not to shut it down because it was too valuable and this and that, so they never did shut it down at that time. I don't think they ever got a drop of gasoline out of the plant or oil, whatever they figured they were going to get out it. A terrible waste of money in my eye. They finally did shut it down. I came home and the draft board welcomed me with open arms. That's when I was inducted into the navy as an apprentice seaman.

Anyway, when I got out of the navy, I didn't know if I wanted to stay in mining. It didn't look like I was going to make much progress. Then I said, "Well, I'll go up to see Vera Christie at Berkeley and see what she has to offer."

Vera Christie was in charge of jobs for the students and also for the alumni. I had gotten many jobs from her while I was

in school. She was wonderful. Every time you needed a little work, she always had some place to place you. Of course, she was glad to see me and she said, "Well, I just happen to have an inquiry from Westvaco Chemical. They are about to sink a shaft in Wyoming and they are looking for a mining engineer."

I said, "Well, I guess I'll try once more."

V HEAD ENGINEER AT A TRONA MINE, GREEN RIVER, WYOMING, 1946-1950

Downey: Westvaco Chemical was a small outfit that took the brine from the salt companies down near Redwood City and took the minerals out of the brine after the salt was taken out. They were making different chemicals. They had a little open pit in Nevada that they mined some non-metallic mineral; I don't remember what it was, but they used that in their chemical plant.

Then about that time, there was an outfit in Green River, Wyoming, named Mountain Fuel Supply Company. They had taken a lease on this property not too far from Green River before the war and they drilled for oil. They were oil people. They had come upon a deposit about ten or twelve feet thick of this white stuff. Nobody knew what it was. The cores were just put aside because that wasn't oil. They were looking for an oil bearing strata. There was lots of oil shale but they never could find any oil in their drilling.

So this stuff sat there until somebody took it and had it tested. It turned out to be trona, calcium hydrogen carbonate. They had never found a deposit of it in the world before. This was the first time they had ever found a source in place underground. It had always come from dried lake beds before. Most of it came from a synthetic product called the Solvay process, and it was used as a catalyst in many, many industries. It was quite valuable.

Swent: The lake bed was down in southern California, wasn't it?

Downey: Yes, right. There were also big Solvay plants in the East that were making this stuff. It's very expensive. This Mountain Fuel Supply Company didn't know what to do with it. Somehow or other they talked to Union Pacific, who had land there. Union Pacific said, "Well, we're not interested in it."

Somehow Westvaco Chemical heard about it. They said, "Boy, this just sounds great. We'll take up the lease and sublease it from Mountain Fuel and sink a shaft." I don't know how they ever

got into this because they were not mining people. They were chemists, chemical engineers. It was a terrific, big undertaking.

But they hired me to supervise the sinking of the 1500-foot-deep circular concrete shaft. Instead of hiring a good shaft sinking outfit who had done a lot of that, they hired Morrison Knudsen, who were railroad builders and not really shaft sinkers. There again, it was somebody on the board of directors who knew somebody. Oftentimes there was a job that way.

I remember we had just got the shaft started and one of the executives came out from New York. I'm sure he expected to see Indians and cowboys and everything else because anything west of the Hudson was Indian territory to those people in New York. He looked around and he said, "Tell me, how do you know that this place where you are sinking the shaft is on our property?" We had to spend a great deal of time to explain to him that we had found the USGS markers and we had surveyed and knew exactly where we were. He looked around there; there was nothing but these wide open spaces of Wyoming, sage brush and sheep. He just couldn't imagine how we knew where to sink the shaft.

Anyway, we got the darn thing going. It started off pretty good until they hit some caustic water about half way down. They drilled diamond drill holes in it and tried to grout it off with bentonite and all this stuff. It didn't work very well. It still leaked. It got to be a terrible job. If you got that stuff in your eye, it was terrible. You had to wear protective clothing. It made the shaft sinking much more difficult.

Anyway, to get this caustic water out of the bottom of the shaft, they had to find a pump that had liners in it that wouldn't be eaten away by this caustic water. They found the Bean pump. The Bean Pump Company, in San Jose, had developed a pump to pump insecticides, which are also very caustic. So we bought a couple of Bean pumps. The Bean people came. We found out later that the Bean Pump Company was a subsidiary of Food Machinery and Food Machinery bought this mine out later on. I don't know whether it was because they liked the idea of the thing when they were there helping us install the pumps or not, but that kind of ended my career with Westvaco Chemical.

Swent: What difference would it have made if there had been mining people or a different shaft sinking outfit than Morrison Knudsen?

Downey: It would have gone a lot smoother because they kept putting in new superintendents. They would get one superintendent and he was terrible or he would be a drinker and they would get another guy. There was no continuity. The head honcho for it wouldn't stay

Westvaco Chemical surface workings, Green River, Wyoming, 1947.
Downey house at left with car parked in front.

there. He would come and look at it and wave his arms and tell them to do this and then he would take off instead of sticking around and making sure the thing was going all right. He would go off somewhere else.

The thing that really turned me off against them was that the man who was in charge when I was doing the shaft sinking and afterwards was another mining engineer, Gil Gaylord, a good man--he had a lot of experience. He had been in South America. We got along fine. But they brought somebody else in over us--a chemical engineer who had never been underground--and that was really a blow to both of us. So I stayed on for a while as mine superintendent but then I decided that was not for me. There again, maybe if I had stayed, things would have been fairly different, because they expanded tremendously. That is one of the largest mines in the country today for soda ash. This fellow they brought in was long gone, I'm sure.

VI LEAVING MINING FOR GENERAL CONSTRUCTION ENGINEERING

A Brief Attempt at Farming

Downey: But there again I didn't stay. I came back to San Francisco and went to Watsonville because my in-laws had a piece of property down there. I thought maybe we could develop it into a farm and do some farming. My brother-in-law had gone to Davis and he wanted to try his hand in farming, so I said, "Well, we'll try that and get away from mining for a while." Like everything else, we were short of money and not too good on experience.

Kaiser Chemical Company, Moss Landing, California

Downey: I worked for some construction people down there to help out. Oh yes, one of the jobs I got was to work for Kaiser Chemical. They had a plant in Moss Landing. They were making bricks for furnaces. They had a little property over in the hills about ten miles away where they were mining this clay material to make the bricks. They wanted somebody to go over there and install a lot of new machinery. It was mining-type machinery and metallurgical-type machinery, milling thickeners and trommels and screens. So I enjoyed getting back into that part of mining.

Then I came back and helped them build an addition to the plant. That looked like it might work into something, but then the job was finished. They offered me a job to go to the Caribbean where they were opening up a big new development for bauxite. I didn't think I wanted to go over there. It didn't sound too good. My children were getting school age and I thought I'd better stay put.

Western Knapp Engineering Company, 1952-1955

Downey: So then I heard about the job with Western Knapp Engineering. There was an interesting little connection there. Jim Knapp was a good friend of my uncle, Peter Jurs. They had known each other from way back. Jim Knapp had been smart enough to foresee the coming of World War I because he got into the scrap business and had a tremendous pile of scrap metal. When World War I came along and he sold it, he made a lot of money. He had wanted my Uncle Peter to go in with him. Uncle Peter, very conservative, didn't think he would ever make anything of it.

So after the war, Jim Knapp decided he was going to start getting into mining. So he bought all kinds of mining equipment. Mining was kind of slack in the twenties. Then 1933 came along and the price of gold boomed and Jim Knapp was in the catbird seat again. He had all this used equipment and he sold it right and left. All these mines were starting up. He formed this company, Western Knapp, and they got into designing, engineering, and building mining and milling facilities. That's when I went to work for them.

The first thing they did was send me to Climax Molybdenum; the company had gotten a job with Climax to install a big vertical sintering plant to sinter Climax's ores. The fellow who had been up there just couldn't take the altitude. He got altitude sickness all the time and they had to replace him. So I went up there. I felt a difference. This was around 14,000 feet. I could tell that all right. I used to get short of breath. I had Sunday off so every Sunday I would get in the pickup and go down to the lower level, to Denver or Colorado Springs or some place, and get some oxygen in my lungs.

I was recently reading the latest edition put out by the mining museum in Leadville and I saw that Robert Henderson had been made an honorary member of the organization. That reminded me of a little incident that I had with him when he was running the Climax Molybdenum job. He came down one day to look at what we were doing. I was gone. I had gone down to Leadville to get some equipment or buy something. I came back and I saw this guy coming out of there, a little fellow with no hard hat on. I said, "What are you doing in here without a hard hat?"

He ruffled up and looked at me and said, "Do you know who I am?"

I said, "No, I don't know who you are."
"I'm Robert Henderson. I'm the general manager here."

"I'm glad to know you, Mr. Henderson, but if you come to this job you wear a hard hat." He grumbled and stalked off.

That was the only time I ever met him. I got to thinking, "My gosh, maybe he'll report back and they'll fire me." But nothing ever happened of it. But those days, I was pretty gung ho about safety and hard hats and hard toe shoes and goggles and everything. I believed in it very firmly.

Swent: He should have been grateful to you.

Downey: Well, yes. He went on to become very well known in mining. In fact, they named the new mine after him, the Henderson Mine that they developed.

I came back to Western Knapp. They were looking for work and they said, "How would you like to go out and do some business development?" I said, "Oh, okay. That's sounds good." They gave me a car and I started going around talking to different outfits.

Swent: You were based in Denver?

Downey: No, in San Francisco. We had moved from Watsonville to Palo Alto. It made a nice commute.

Up to that time, I don't think Western Knapp had ever done a job more than maybe a million dollars. It was a big job for them. So we had a team of estimators and engineers working on doing estimating. So the chief estimator heard about a big job going to be done by Kennecott at the Hayden smelter in Hayden, Arizona. He said, "We're going to bid that one."

He grabbed me and we got on the plane and went to Salt Lake City to talk to the head people. Stanley Michaelson had never heard of Western Knapp. "How do we know you can do that kind of job?"

"Well, we'll do it."

They wanted to know how much we were going to charge for estimating the job. There were a lot of other questions. We were able to answer the questions pretty well so they said, "All right. We'll let you bid it."

So we came back, put a good team of people on it, engineers and estimators who estimated the job and came up with a price around $21 million. We talked to the managers and the head people at Western Knapp and they were aghast. "$21 million! My God! Suppose we go broke?"

"Oh, no. We've got the money. It's a good job."

So to make a long story short, they got the job. The only other bidder was Utah Construction and they were $3 million more than we were. That almost gave them apoplexy at Western Knapp because if you leave $3 million on the table, you're doomed.

It was a wonderful job. They came out very well, made a lot of money. They were just fantastic. They designed the thing and built it. Kennecott was happy. That looked like that was going to be great stuff in the future.

Well, anyway, I found out there was a lot of internal dissension in the company. There were people sniping at us in the estimating department and in the engineering department and the sales department and the machinery department. There was no coordination. They weren't working together. I felt very uncomfortable about it.

Swent: Was Knapp still running it?

Downey: No, he had retired. There was one fellow there named Ralph Utt who was trying to make the whole thing go and they were blocking him in every way. He was a good man, a real top manager. But the head honcho there didn't agree with him.

So then we had another chance to bid a big job down at Trona in southern California. They had this big expansion plant. So we got on the job, got the drawings, and put a bid together on that one. That was another big one, over twenty million dollars. But this time the head people at Western Knapp decided they were really going to make a lot of money. They added a lot of overhead and a lot of profit and stuff and consequently, they didn't get the job.

They brought somebody from the East as manager. Ralph Utt left and they put somebody else in there to take his job. They started looking to clean house. I guess I felt that maybe I was going to get cleaned out. So I moved on and got into construction.

Swinerton and Walberg, Inc., 1955-1960

Downey: I went to work for Swinerton and Walberg, mainly because Swinerton was a mining engineer and when he read my application, he saw an interest in doing mining work, mills and metallurgical work. He said, "Well, maybe we can develop some work."

"That will be fine."

So he put me on in the estimating department.

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Swent: And where were they based?

Downey: In San Francisco. A very old-time construction company. I liked the people there. They seemed to know what they were doing. They looked like they might be able to develop some mining work.

Swent: Did you have other Cal friends there?

Downey: No. I didn't know anybody. It was all just a bunch of strangers whom I had never met before. I did some estimating for them. They seemed to like my work so they said, "Why don't you go out and develop some jobs."

Swent: This was 1956?

Downey: Yes, right. "Develop some work for us in the mining industry."

I said, "Fine, I'll try." So I contacted my old friends and I stopped into an old engineering firm that I knew in San Francisco. I saw they were doing some design work for a uranium plant in Colorado. I said, "Oh boy, this is what we want to get."

So I got a set of the drawings and took one of the fellows from the estimating department in Swinerton Walberg and we went out there. It isn't Moab; it was the next town beyond. The end of the line, Monticello. They had a uranium mine going there. They wanted to put in a mill. It was a pretty good sized job. We walked into the office and who should be sitting there in the manager's job but my old friend from Stanford when I was working in Grass Valley who shared our house there on the mine property, Truck Dellinger.

Swent: What was the first name?

Downey: Well, they called him Truck. I don't remember what his first name was. Everybody called him Truck. His great fame came because he swallowed more goldfish than anybody else did when he was at Stanford. [laughter] He was one of those kind, a real good guy but rough and tough, a diamond in the rough. Anyway, he was surprised to see me and I was surprised to see him. I thought, "Oh boy, I've got to have a good chance to get this job." We bid it but we weren't low.

Then there were several other mining jobs we looked at, metallurgical work. I never was able to get one so I ended up doing mostly paper mills and industrial type of work, estimating.

Swent: Were you on a salary?

Downey: On a salary. Not a commission, it was a straight salary. Let's say it was a good place to work, congenial people.

I was over in Richmond one day. We were bidding a little job at Standard Oil and I ran into this fellow whom I had worked with on the Canol job in Alaska and Canada. He said, "I started my own company here. I'm doing all kinds of work. We're just busy as heck doing refinery work and some other kind. Why don't you come work for us?"

I said, "I'll think about it."

Pacific Mechanical Corporation, 1960-1965

Downey: So he offered me a job I really couldn't turn down. I left Swinerton Walberg and went to work for Pacific Mechanical in Richmond and there again I was supposed to get stock. I guess I hadn't learned my lesson from Idaho. I believed that they were going to put me in stock but that never materialized. I kept asking about it and they kept putting me off. So I decided I had better not stay too long, get too involved and never get the stock options they talked about.

They were a funny bunch. The boss's name was Pheris. They were from Texas; they were all a bunch of Texans. Funny people. I had never worked with Texans before. I didn't understand the way they worked. Pretty good people. They were good mechanical contractors but they had different ideas. It was a family thing. I guess they decided they didn't want any outsider owning stock. That was probably the whole crux of it.

VII DEL MONTE; THE BEST OF TIMES, 1965-1976

Downey: That's when I ran into an old friend from Cal Mining, Claude Artero, who was working for Del Monte. He said, "Del Monte is looking for an engineer to head up their proposed research facility in Walnut Creek. Why don't you come and talk to them?" So I did. He introduced me to the director of engineering, Ken Sanger. That's how I got started with Del Monte. They hired me for a temporary job, maybe a year, to be in charge of the building of their research facility in Walnut Creek.

That turned into ten years, the best of all times I think. I had started a course in evening school to qualify and get into an MBA school. I got into the University of San Francisco evening school for an MBA. I said to the boss one time, "Does Del Monte ever pay for people's education like this?"

He said, "Well, I don't know. Which would you rather have? Do it yourself and then get the reward after you finish and get your degree?"

I said, "Yes, I think that sounds like a good idea." That was a smart thing to do because I really got some good raises after I finished getting my MBA degree.

They sent me all over. They sent me to Florida to set up a whole, complete engineering construction complex to do a plant down there. They sent me to Canada. I went down to Mexico, to the Hawaiian Islands. I travelled an awful lot with them and saw a lot of the country. I just enjoyed them so much.

Swent: You were doing construction?

Downey: Construction. Just putting jobs together. Finding engineers, designers, draftsmen and contractors to do the work after they finished. It was a very successful job on the research facility. They just let me go. They found out I could do this stuff without anybody checking on me. I was really happy.

Then the fuel--energy--crisis came along and they got all worried how they were going to get fuel for their plants and fishing fleet.

Swent: That was 1973?

Downey: Yes, right. So they appointed me director of energy management and conservation. Again, I had to go around to all the plants and set up energy conservation programs. That was a very challenging job.

Swent: They had plants all over.

Downey: All over the world. In forty different countries, they had plants. I didn't get to all of them but I saw a lot of them. They were very cooperative. Everybody was real gung ho. We cut our energy costs way down, 25 percent in some instances.

Swent: How were you able to do that?

Downey: Just by going in and showing them where they were wasting energy. You would go into a restroom, turn the water on and burn your hands. I said, "Cut the darn thing down. You don't need boiling water in a restroom."

I would look at the steam piping in the plant. They wouldn't have any insulation on it. I said, "Put some insulation on that pipe." I checked their boilers. Some of their boilers were very inefficient. I would get the boiler people to come and show them how to get them working just right. They were very cooperative. They were glad to do that. We just did a real good job on cutting our energy costs.

Of course, every year I got a raise, every year I got a vacation, I got a pension, had health care, dental care, all these things that I had never had before anywhere I worked. Actually that was a culmination of a very sketchy career, nothing very permanent about it.

Swent: Typical of most engineers, however.

Downey: I guess so, especially in mining and construction. You work until the mine shuts down and the construction job is over. Then you go look for another one. There's not much true permanency in any of them.

I have a little philosophy here. One salient fact that I failed to appreciate in practically all of my jobs after graduating, until Del Monte, was that no matter how well one

performs, it is more important to be viewed as a team player by one's supervisors. You must be willing to take on any assignment offered, move to wherever they want you to go, accept bosses who have reached their level of incompetence, and if you're married, have a spouse who is well-liked by the wives of the company executives. [laughter] I learned all that a little late in life but it worked well at Del Monte.

Swent: A practical philosophy. You mentioned to me the other day a report from SRI [formerly Stanford Research Institute].

Downey: Oh, yes. I forgot about that. I hadn't been at Del Monte more than a couple of months. They called me into the vice president's office and he said, "Look at this report from Stanford Research. Read it over and see what you think about it."

So I read it. It proposed that all Del Monte's plants that put out canned goods--they were cooked in autoclaves under high heat and pressure--SRI theorized that why go to all that expense of having all these different cookers. They had rows of autoclaves in these big plants, every one of them heated up with high-pressure steam. Why not put everything underground, in a big cavern underground, and pressurize the cavern; therefore, you wouldn't have to have any pressure cookers? SRI really thought that was great.

This vice president just gave it to me as kind of a joke to see what I would do because he knew that I was a mining engineer, in metallurgy and what not, and I had experience working underground. So I took the thing, wrote a report, and told him how impractical it was. I said, "First of all, you would have to hire a bunch of people who were used to working under pressure, like the sandhogs--is that what they call them?--who work under the Hudson River in those tunnels?" Anyway, they have to work under high pressure and go through these pressure gates to get out and go in. It's terrible. I said, "There would be another union you would have to fight."

So I turned the report in with all my negative things. I spent a lot of time on it, tried to do a thorough job. They thanked me. "That was what we thought. We just wanted to make sure we weren't missing anything."

They brought in another outfit, McKensie & Company, to study their engineering department. They made a great big amount of reports and a lot of suggestions on how to change the engineering department around. My boss gave me that to read. I said, "This will never work. It's crazy. They're talking about some enormous

big company with hundreds and hundreds of engineers, and here we have maybe twenty." So that report went into the circular file.

I guess I was lucky to have come in at a time when they were going through this transition. They were looking for people with new ideas and a little outside expertise. Like most companies, Del Monte had become kind of ingrown. Men would go up and have their sons come along behind them. It was kind of getting to be a family affair. I think that was one of the reasons they finally had to sell out to Reynolds Tobacco because there just wasn't enough new blood, young blood, to be able to keep the thing going without some outside help.

Now they've come back. They've done pretty well. The employees have bought the company from Reynolds and they seem to be doing real well. So hopefully they will be back in business again as a well-known San Francisco company.

Swent: You said that your pension retirement benefits had continued.

Downey: My pension and retirement benefits and health benefits. That was continued all the time they were going through all this transition, being kicked around. Headquarters had moved back to Connecticut. They were under Nabisco for a while. They never missed anything on my health benefits, dental and pension.

Swent: That's wonderful.

Downey: Which I was very thankful for. Now, as you know, they've brought the retirees under the matching of funds, gifts to non-profits, which is very good and so I'm really happy about that.

Swent: That's really exceptionally good.

Downey: Yes, so they must be doing fine. And it's very encouraging to me that they are doing well. I have a friend who worked his whole life with Pan Am. I wonder how he feels about what is going to happen to his pension. They're gone. They're laying off twenty thousand people as of yesterday. You never know.

Swent: And also, among the mining companies, not all of them have kept their benefits as they have closed down.

Downey: No. There have been a lot of them that go. Just no more money. So I feel I was very fortunate. Oh, another little anecdote with Del Monte. They decided to build an international headquarters building when they got a piece of property up on Third and Howard in San Francisco from the Redevelopment Agency. They got it for a song.

They formed a building committee--and I was on the committee--to hire an architect and get an engineer, contractors, the whole works in there. When we hired the architectural firm, the top brass weren't quite sure that they were going to be what they wanted or if they knew enough about high-rise construction. So they hired a consulting architect, a world-famous man, Pietro Belluchi. He was known all over the world. I didn't know if they really needed him or not but he was a lot of fun, a good guy, I enjoyed him.

One day I was talking to him and he asked me what my background was. I said it was mining. He said, "You know, that's interesting. When I was in Italy coming over to this country, I came to Washington to talk to the Italian consul."

He said, "You know, Pietro, you are going to have to learn English. I suggest you go to work for Bunker Hill and Sullivan in Kellogg, Idaho, work underground and you will learn English."

Pietro said, "That's what I did. I went to work as a civil engineer underground at Bunker Hill and Sullivan. I learned English but mostly I learned swear words." [laughter]

Swent: I would think he might not learn very good English. [laughter]

Downey: That was funny. I laughed about that. I told him, of course, I had worked for Bunker Hill and Sullivan.

Swent: That's the first time I have heard an underground mine recommended for English. [laughter]

Downey: I don't know. I guess this guy in the Italian consulate might have known somebody from Bunker Hill and Sullivan. Anyway, Pietro never left the West Coast, he liked it so well. Last I heard (I don't know if he is still alive), he was in Portland, Oregon, retired. A wonderful person. He was smart; boy, he was good. He designed the Catholic cathedral in San Francisco, St. Mary's, up on the hill. Wonderful. He had a wonderful feeling for space.

I think that international headquarters would have been something. But of course, when Reynolds Tobacco came into the picture, they said, "You don't need an international headquarters." That was the end of that.

Swent: So they never built it.

Downey: Never built it. But it was fun doing the planning for it.

VIII EXECUTIVE SERVICE CORPS

Swent: I also want you to tell about your Executive Service Corps work.

Downey: Oh, yes. When I was in Costa Rica for Del Monte, looking into some of their banana operations, they were figuring out how they could do better transportation. We were talking about building a box plant down there and cut costs. I got quite friendly with the president of the banana subsidiary, Del Monte Banana Company, an awfully nice fellow, Sammy Gordon.

I said, "Sammy, you are going to have a lot of problems. After I retire, why don't you think of hiring me as your consultant?" I had done some other work for them in different parts of the U.S. and Central America and they seemed to like my work.

He said, "That's a good idea. Why don't you join the 'Paunch Corps?'"

I said, "What's that?"

"That's the International Executive Service Corps. It has people down here. I happen to have one of their brochures, the circulars they send out. Why don't you apply?"

I got back to San Francisco and after I retired from Del Monte, I sent in this application. I kind of forgot about it. I had a consulting office in San Francisco doing some energy conservation and a little design work here and there. I got this telephone call from New York, the International Executive Service Corps. They wanted me to go to Italy on a tomato processing plant.

Well, I was just in the process of moving. We were moving from San Francisco up to Santa Rosa. I said, "I can't go right now. I'm moving things. But keep me on your list."

Then I heard from them again in maybe six months. They had a job in Egypt. So I said, "Okay. I'll take a crack at it."

They sent me all this stuff to fill out, all this stuff we were going to do in Egypt. It seemed that Egyptian President Anwar Sadat wanted to get out from under all this communistic business that Nasser had established. He wanted to get back and bring in private business. They had a chance, got some AID money and some of their money to build a sugar plant down on the Nile River delta very similar to a pineapple plant. So they wanted an engineer to come over there and help them. The IESC offered to put somebody to help them put an engineering department together and get the thing going, set up quality control, purchasing, all the rest of it.

So I went over under those circumstances. My wife, Alberta, came along with me. They set us up in the Cairo Hilton, first class. Everything was first class. There was no pay but they paid for all your expenses. The first thing I learned was that nobody drove an automobile in Cairo. You had to have a chauffeur. They told me the chauffeur would be there the next morning to take me to the office where I was going to do my work. I went down to the lobby and waited, waited, and waited. And no chauffeur. I finally called up the IESC office and said, "What's wrong? It's ten o'clock and they haven't come for me yet." Anyway, they had come but they had picked up the wrong guy. They had picked up some guy who was standing there. He didn't know, I guess, and the driver didn't know. But I finally got to work. That was a big problem. You had to be sure you got the right driver who took you where you wanted to go.

In the afternoon, everybody seemed to disappear. They have a funny way of taking a siesta about three o'clock in the afternoon. All of the Egyptians go home, sleep, eat a big meal, and then they come back to work, maybe until eight or nine o'clock at night. I always had a big problem finding a way back to the hotel.

My wife enjoyed it. She went to the museum every day. She took courses in the American University. She got a job as an extra on a film they were making. "The Sphinx" it was called. The only part about it that was any good was that John Gielgud was in it. It wasn't much of a movie. She enjoyed that. She got paid. Paid! She was getting thirty or forty dollars a day and all she could eat. She loved it. She met a lot of interesting people. It was quite an experience.

I finished getting this thing set up. But my problem was that engineers were very scarce. Under Nasser they had a ceiling on wages. So a good engineer would graduate from one of their schools. They were pretty good engineers. The first thing they would do is go to Libya or to Kuwait or to Saudi Arabia. They would make big money. There was no ceiling on the wages in those

countries. So the caliber of engineers that they gave me to work with was not too good.

I had a hard time. They didn't understand spoken English too well so I ended up writing the whole thing. I wrote a big report on exactly what they would do, step by step, how to check the steel, concrete, how to check everything. It was almost a textbook. They couldn't get any typists to do it, so Alberta ended up typing it for me because the guy who was supposed to be my secretary only spoke French and Arabic. I had an awful time conversing with him in French. My high school French was pretty weak but we managed to get along all right.

Was it on "60 Minutes" that they were talking about the waste of AID money in Egypt? Well, we could see that when we were there, that the money was just being squandered. The poverty, the filth, the terrible conditions that I got to see on the Delta scared me to death. I knew darn well that those people weren't getting any of that AID money that was being poured into Egypt. It was going to the executives, the head of the government. It was going to the army infrastructure. They were building a few things but not very much. Memorial highways, bridges and what not. I think that maybe they'll do something about that and not be so generous, or at least follow up on it and make sure that the money gets where it should get to help the poor.

Swent: Did the sugar plant get built?

Downey: The sugar plant got built. When they started to build it, it looked pretty good. Sugar was twenty-five cents a pound. It looked as if it would be a profitable thing. Later it dropped to eight cents.

Swent: This is the cane?

Downey: Beet sugar. They had cane sugar along the Nile, but there wasn't enough. The Egyptians are just crazy about sweets. On almost every block in Cairo there is at least one bakery and sometimes there were two. They would go in there and come out with these big boxes of these sweets. And Coke. They drink Coke like it was going out of style. Because they don't drink liquor. It's banned. One can't find any liquor there at all except in private stores. They have beer. It has a little bit of alcohol in it. We drank that because it was better than the water.

Anyway they were going to build this plant. I asked them one time, "Do you know that they can grow sugar beets down on the delta?"

"Oh yes. We can do it. The Americans came over and told us all we had to do was flush out the salt in the delta and the beets would grow."

Well, I didn't know if that was going to work or not and I never did find out. The plant was being designed by a French outfit and the local contractors, who I think were all related to Sadat, were doing the job. It was so archaic, all labor. I asked the superintendent one time, "Why do you have all these people handling stuff?" They were putting some piers in on top of the piles that were the beginning of the building. The concrete truck would come along and dump the concrete about twenty or thirty feet away from the piers that were to be filled and a bunch of young girls would come with baskets, put the baskets down, some poor guys would come with shovels, fill the baskets, and the girls would pick them up, put them on their heads, walk over to these forms and dump them into the forms. I said, "What are you doing this for?"

He said, "We have got to have these people work. We have to get jobs for them." That was how they did things. And that was a lot of our AID money.

I'm now working with Executive Service Corps in this country.

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Swent: What sort of thing do they do in this country?

Downey: In this country, we only work with non-profit organizations. It is an offshoot of International Executive Service Corps which was started by Frank Pace and one of the Rockefellers, I forget which one. Maybe it was David. So this offshoot of International is strictly working with non-profits. There are thirty different organizations throughout the country. This one locally is in San Francisco. Then there is a branch office in San Rafael. I work out of that one.

My job is to screen requests that come into my house for people in non-profit organizations who need help. I usually get all the information I can and I transfer it to the San Rafael office and they look at it. If they think it is worthwhile, then they'll ask me to go and make a feasibility study. I talk to all the people I can in the non-profit--the board of directors and the executive director and everything--and find out what their mission is and what their budgets are and what their problems are. I write this report and it is sent in back to San Rafael.

Then they decide who they can put on it, the people with the right experience to help them out. So far there have only been three jobs come in where they needed anybody with engineering construction experience. But I've worked on three jobs in helping either remodeling an existing facility or building a brand new facility down just north of San Rafael. So that keeps me busy, keeps me occupied, and the brain has to keep working.

Swent: That's true. You mentioned that you were advising a housing development. Was this part of the ESC? A group that was planning a retirement home?

Downey: Oh yes. They are planning a life care facility. This is brand new. A friend of my wife knew about this thing going on. I don't know where she heard about it but she told my wife. So we wrote to them and told them we were interested in it. They sent us all this propaganda about what they were going to do. I thought, "Gosh, that's a good job for ESC."

So I went to one of their meetings and got to meet the vice president and told them about ESC. He knew about us. I said, "Maybe we can help you, hold your hand while you're going through all this selecting engineers, contractors and what not." So that's what we're doing now. We're talking to them. We haven't met the head man yet, the president, but we hope to be able to set up what they call a mentoring system, where we get a group of maybe four or five different retirees who have different backgrounds, different things to offer. It would be set up as a group and any time this life care outfit needs some help, they call and say that they want so-and-so to come and give them some advice.

That is set up under a fee; they give a one-time fee and then there is no more cost. Many people are available for that year. That fee goes for a year. Say you like it, then the next year is another fee.

Swent: Sounds like a wonderful way to tap into a lot of good experience.

Downey: Yes. Boy, I'm telling you. There is so much good experience in these retirement areas like Oakmont, anywhere you go, you find people who would just love to have something to do.

Swent: All of that wonderful knowledge.

Downey: Oh gosh, yes. That experience is just wasted. It's a shame that so much of it goes to waste. Every once and a while I will talk to somebody about ESC and they'll say, "Oh, that's great." I get them to put in an application for ESC. Anyway, hopefully this

will be the biggest job they've ever tackled. I think they are talking about around $15 to $20 million investment. So it will be a good job.

Swent: You may get them to build a tunnel.

Downey: They may be able to get a tunnel. They are right on top of a hill. It's the darnedest thing you ever saw in your life. I said, "How are they going to get people from this side of the hill over to the other side?"

"Oh, we'll build roads. We'll have little elephant trains to take them."

I said, "All you need is a tunnel right through that hill."

"You know, that's not a bad idea." [chuckles]

Swent: No, it isn't.

Downey: Who knows? Maybe I'll be back doing tunnel work before it's all over.

Swent: Maybe you'll be digging some rock after all. [laughter]

Downey: Yes. I haven't done any for a long while.

Swent: Well, I think we covered just about all our points, didn't we?

Downey: I think so. I don't see anything else that is really pertinent.

Swent: This is going to be a wonderful addition to what you've already written.

Downey: Well, it's real wonderful of you to let me do all of this because, as I say, I didn't talk about personalities of those of my peers and mentors in the autobiography. Now I think I've covered all the main mining people I knew.

Swent: Well, then, that's deep enough?

Downey: Deep enough, that's right. She's deep enough; we've driven the last wedge.

TAPE GUIDE

J. WARD DOWNEY
Interview 1: December 6, 1991

For four years, beginning in 1984, Ward and Alberta Downey were enrolled in an autobiographical writing class given through Santa Rosa Junior College at Friends House in Santa Rosa. The instructor was Mrs. Geetz Vincent, and according to Alberta, Ward was the star pupil. Portions of his memoir written for this class are included here as relevant to Western Mining in the Twentieth Century.

MUCKER, MINER AND MULE SKINNER

Memories of a well spent youth

INTRODUCTION

There are few periods in my life that I am able to recall so clearly as the years from 1932 to 1936. Not only were they among the best times of my youth, but they also marked a series of far-reaching changes which shaped my whole future career.

Upon enrolling as a freshman at the University of California in Berkeley in August, 1929, I chose Petroleum Engineering as my major, influenced largely by the success of an older cousin in that field. At the end of my first year, I remained out of school and found work at the Avon, California refinery of the Associated Oil Company, hoping to obtain some experience in the oil business. The exposure to the oil industry, although perhaps too limited, failed to convince me that my career choice had been the right one. Consequently, upon returning to Berkeley in the fall of 1931, I changed my major to Mining Engineering. Peter Jurs, a favorite uncle of mine, who worked in the Mining and Dredging Department of Bethlehem Steel Corporation, had a great deal to do with this

decision. However, I suspect that the tales told to me by my mother about my grandfather, who arrived in California in 1851 to seek his fortune in the gold fields, had even more influence on my switch to mining.

Again, at the end of the 1932 spring semester, faced with a shaky grade-point average and a depleted bank account, I took a leave of absence from school and started looking for work. My uncle, Peter Jurs, offered to write a letter of introduction for me to a business acquaintance, the manager of the Empire Gold Mine in Grass Valley, California. I gladly accepted his kind offer and, with twenty dollars in my pocket, I took off by bus for the Northern Mines of Nevada County. I had not the slightest premonition of what fate had in store for me over the next four years.

My story revolves around what was then one of the most famous mining camps in the world. It describes how an unsophisticated youth of 20, uncertain of his goals in life, by being thrust into the real world of working thousands of feet beneath the surface of the earth, learned more and matured much faster than if he had continued his formal education without this fortunate interlude.

Before continuing, look back with me almost 140 years to a small town in County Cork, Ireland, where my

grandfather, Hubard Ward, had decided to leave his homeland and emigrate to America. Once there, he would sail around the "horn" to San Francisco and then travel to Grass Valley, preceding me by some 80 years.

AN ESCAPE FROM TYRANNY

Ireland in the nineteenth century was not a pleasant place for most Irish to live. Miserable working conditions, hunger, and political unrest brought on by repressive English rule made existence there a dismal one. In 1846, 1847, and 1848, devastation visited these unfortunate peoples when a blight hit their farms, resulting in the almost complete failure of the potato crops. During these turbulent times, a million Irish died from starvation and another million emigrated, most of them to the United States. Along with thousands of other young Irishmen, my maternal grandfather left his homeland in 1849 to seek a new life in America. Like most of the others had done, he promised to send for his family when he could.

The inhabitants of Boston, where he eventually settled, did not have the welcome mat out for this horde of immigrants. Rather, they looked with undisguised disdain upon the Irish Catholic "red necks," as they were called. Advertisements for help in the newspapers often

stipulated that "Irish need not apply." It is no wonder that my grandfather found it imperative to leave this unfriendly place as soon as possible.

In August of 1850, he boarded the brig "Tigress" in Salem, Massachusetts, along with a cargo of molasses, honey and "other miscellaneous merchandise." He was the only passenger. One hundred sixty days later, on February 3, 1851, the ship arrived in San Francisco. (In 1980, we traversed a part of his route on a luxury cruise ship, sailing uneventfully through the Straits of Magellan. For those pioneers like my grandfather, making the voyage in small sailing ships, it often took a month or more just to traverse the treacherous waters of the Straits, struggling against fierce winds and currents.)

Gold had been discovered in early 1848 at Sutter's Mill on the American River in California and, by the end of that year, ten thousand prospectors ranged from the eastern tributaries of the Sacramento River to the creeks and streams flowing into the San Joaquin River. Those early comers represented only the vanguard of the hordes of gold seekers yet to arrive. Around Cape Horn, across the Isthmus of Panama, over the plains from Missouri, through the southern deserts they came by the thousands. More thousands arrived from Europe, Asia, South and Central America until by 1850, it is estimated

that 100,000 immigrants swarmed over the Sierra foothills in search of the elusive yellow metal.

By the time grandfather Ward arrived on the scene, San Francisco had sprung up from a sleepy settlement of about 2,000 in 1848 to a bustling hub of over 30,000 people. They lived in tents, shanties, flimsy houses with muslin walls and in the hulks of ships left by seamen who had deserted for the gold fields. This town of temporary shelters, mud streets, brawling drunks and exorbitant prices must have shocked my grandfather, coming as he did from a simple farm life in Ireland and later living in staid Boston. He did not tarry in San Francisco very long for he had left the east coast with a job waiting for him in Grass Valley.

By October of 1850, the town of Grass Valley consisted of a few cabins built to house some early settlers who farmed the area and raised cattle. The mad scramble for gold, taking place in the nearby Sierra foothills, had not yet touched this verdant valley. On October first of that year, George McKnight, excavating for foundations to support his new cabin fireplace, struck a vein of gold-rich quartz. Within a few months, a steam-operated stamp mill had been erected and the gold mining boom that was to last for almost 100 years had begun.

The gold seekers who flocked to Grass Valley, after the initial discovery, had only placer mining experience learned in the streams of the adjacent foothills. They lacked the necessary skills needed to sink shafts and properly mine the hard, gold-bearing quartz. Companies financed by eastern capital soon came into the area to exploit the rich ore by accepted hard-rock mining methods.

This is where my grandfather enters the picture. He evidently had skills as a millwright since his job involved bringing hoisting machinery up the Sacramento River by barge to Marysville. From there, oxen dragged the equipment to Grass Valley where it was installed at Gold Hill, the site of the first gold discovery by McKnight. With the hoisting machinery in place, the miners could follow the vein downwards by drilling and blasting, the broken ore then being hoisted to the surface to be processed in the nearby stamp mill. (The site of these historic beginnings on Gold Hill is marked by a monument commemorating the birth of gold quartz mining in California.) Once he had finished supervising the job of installing the hoisting equipment, my grandfather then moved on to a new gold discovery some ten miles northwest of Grass Valley.

In September of 1849, some settlers, probably

discouraged after an unsuccessful search for gold, came to an area later called Rough and Ready (after President Zachary Taylor) where they began farming. They could not know that underneath their farmland lay some of the richest alluvial gold deposits ever found in California. History is not clear just when the gold-bearing gravels were first discovered, but grandfather Ward arrived at a most propitious time. He and some partners staked claims and proceeded to develop a drift mine in those long buried gravel formations. Hubard must have sent for his family and bride-to-be by this time as some of his children were born in Smartsville, a town a few miles west of Rough and Ready.

The social life in Rough and Ready and the other quaintly named towns of the area must have been very limited. According to my mother, grandpa would hitch up the horse and buggy and take my grandmother to the Saturday night dance at the more sophisticated Nevada City, five miles east of Grass Valley. They would stay overnight at the National Hotel and return home the next day. The mining venture made Hubard a goodly sum of money, enabling him to buy and sell several businesses and buildings in Yuba and Nevada counties, as shown by the old records in Marysville. While still in his thirties, a tunnel cave-in almost buried him alive. Although rescued

in time, the accident left him permanently crippled. After this frightening event, the Ward family sold their holdings in the area and moved to San Francisco, settling in on prestigious Rincon Hill. The first time my grandfather's name is listed in the San Francisco City Directory is for the year 1869.

It seems that Hubard did better as a miner than a businessman. He became associated with John Daly in an importing business that turned sour. He invested heavily in hydraulic mining company stock which became worthless after hydraulic mining was prohibited in the 1880's by the Caminetti Act. His greatest setback came after the 1906 earthquake and fire when a number of rental properties he owned were destroyed by the holocaust. Compounding this catastrophe, the company carrying the fire insurance on the buildings went bankrupt and he could not collect a cent for his losses.

While still in the money, however, the Ward family lived extremely well. Their last home, a large mansion where my mother was born, stood on Van Ness Avenue near Geary Street. The family employed ample help and the children attended the best schools. My grandfather died in 1907, several years before my birth. I have always regretted that I never had the opportunity to hear first hand the adventures and experiences of a real character

and a pioneer in the California gold mining industry.

Thus ends the saga of Hubard Ward. Although he and his family left the area more than sixty years prior to my arrival, Grass Valley must have looked essentially the same to them as to me when I first saw it. Larger, of course, with more operating mines and influenced greatly by the influx of Cornishmen. But, basically, the town had remained the unique, unspoiled and romantic mining camp that it was when they left.

RUSTLING A JOB AT THE EMPIRE MINE

Grass Valley, in the summer of 1932, had barely been touched by the nationwide depression which left the rest of the country reeling. Nestled in the foothills alongside a fertile valley, blessed with an equitable climate, its workers securely employed in the nearby mines, it well deserved the reputation as one of the premier places for people making their living from mining to live and work. The dull, pounding sounds from the Golden Center's stamp mill in the middle of the town, echoing back and forth from the surrounding hills day and night, all year long, reminded the townspeople of their good fortune to be living there. The piercing blast from the mine's whistle every morning at six A.M., jokingly referred to as the "baby maker," ensured that the men arose in time to keep those stamps going.

On my first day in Grass Valley, as I walked by the rows of neat little houses, enhanced with old-fashioned gardens, and strolled past scores of busy shops along its narrow streets, it all gave the impression

of a prosperous community. I thought to myself, "What an excellent choice I had made by coming to this little island in an angry sea of depressed economies." Before very long, my euphoria had given way to serious doubts as to whether I would ever participate in this prosperity.

On that first day, I rented a room for $3.00 a week, fully expecting to find a job in the mine and move into a boarding house. The next day, armed with my letter of introduction, I presented myself to Fred Nobs, the manager of the Empire Mine, in his office. He greeted me cordially and did not sound discouraging when he told me to show up the next day at seven A.M. in front of his office. The next morning, at the appointed time and place, I joined fifty or more other job seekers. The large number of men looking for work surprised and concerned me. What chance would a single, green kid have against these men who probably had families to feed? When Nobs appeared, he paused only long enough to say, "Nothing today, boys" before disappearing into his office. This discouraging routine went on for the next two weeks during which time only two or three men were hired. By this time, my meager funds had dwindled alarmingly, forcing me onto a diet of crackers and milk. Then, about the middle of the third week, with my spirits very low and the prospect of returning home seemingly inevitable, Nobs

called me into his office and told me to report for work the next morning. My joy and excitement could hardly be described as I hurried back to town to prepare for that long awaited event, my first job in a mine.

Fortunately for me, I had met a young fellow from Stanford named Allan James who already had a job mucking underground. He generously loaned me the money to outfit myself with a lunch bucket, long underwear, work clothes, rubber boots, a miner's hat and carbide lamp, preparing me, sartorially at least, for the big day. James had rented a small apartment in town and we decided that I would move in with him and share expenses.

By the time I arrived in Grass Valley, the Empire Mine had achieved a world-wide reputation. It had long ago ceased to fit Mark Twain's definition of a mine as "a hole in the ground owned by a liar." Once more I will digress from my narrative and trace the history of this fabulous "hole in the ground" that was to shape my ends so drastically.

THE EMPIRE MINE

Soon after the initial gold discovery on Gold Hill, a rash of new finds popped up all around the area. On nearby Ophir Hill, George Roberts staked out his small 30' x 40' claim, the size permitted on placer deposits, and commenced mining operations. The hard quartz proved difficult to work so he sold out to a local group. The new owners incorporated Robert's workings and several contiguous claims they already owned into the Empire Mining Company. Because the company owned and operated a small stamp mill nearby, the venture proved to be very profitable. As the operations expanded, more investors purchased stock and, in 1865, a new thirty stamp mill replaced the old, smaller one. Despite a disastrous fire in 1870, which shut the mine down completely, a new company took over later that year, repaired the damaged machinery and structures, and resumed mining. New gold-bearing veins were discovered and soon the Empire Mine became one of the top gold producers in the state,

with a total output by 1878 of almost $3,000,000. From that time on, the mine operated continuously and profitably, especially from 1896 to 1929, under the direction of the legendary George Starr.

In 1929, Newmont Mining Corporation purchased the property, later incorporating it with the North Star and Pennsylvania mines close by. The new owners spent large sums improving the underground and surface facilities of the mines. By this time the average grade of the ore had fallen from about $15.00 a ton to around $9.00. With the more efficient plant and cost-cutting measures, Newmont managed to show a profit despite the lower grade of ore. In 1933 the price of gold increased from $20.67 to $35.00 an ounce. This enabled the company to greatly increase production from the Empire-Star group as well as to develop several new mines nearby. At the beginning of World War II, Grass Valley could truly be described as a "boom town." The Empire Mine extended over 9,000 feet below the surface (on the incline) and its tunnels reached out for a total of hundreds of miles underneath the town. On October 5, 1942, the War Production Board issued the famous order that eventually shut down all of the U.S. gold mines as non-essential to the war effort. The Empire limped along on a small scale, mostly a maintenance program, until 1945 when gold mining became permissible

again. But, with the increased costs of labor, machinery, and supplies, the Empire-Star group never approached their pre-war gold output or profitability. In 1959, Newmont sold most of its surface facilities and let the mines fill up with water. Thus ended the life of the Empire Mine, one of the greatest and longest producers among California's gold quartz mines. Today, all that remains of the plant and beautiful surrounding grounds are preserved as a state park.

My timing in arriving in Grass Valley could hardly have been better, even though I at first had trouble getting a job. With increase in the price of gold the following year and the concomitant doubling of ore mined, I participated in some of the best years ever enjoyed by the mines of Grass Valley.

A STRANGE UNDERGROUND WORLD

I must have presented a ludicrous sight that first day on the job. Decked out in spanking clean work clothes, carrying a shiny new lunch bucket, no one could fail to spot me as a nervous novice. Other than a few snickers and some suspicious looks my way, the miners ignored me. The coolest reception I received came from the mine foreman, Bill "Lammer" Rowe. Most of the job rustlers checked in with Rowe every day as well as with Nobs. Unfortunately, I had neglected to do this and Rowe showed his obvious displeasure. His attitude clearly reflected the thoughts going through his head as he eyed me up and down. With up to one hundred men, most with families, looking for work every day, why hire a green college kid? In later years I managed to justify getting the job, but, on that first day, my appearance thoroughly riled him. In a gruff voice he ordered me to report to a certain shift boss and told me that I would be on straight day shift. This seemed to me a real choice assignment since the great majority of workers alternated between day

and swing shift. It wasn't long before I discovered the reason for my apparent good fortune.

Descending the inclined mine shaft for the first time was an unforgettable experience. Thirty-three men crouched on cleats on a flat man-truck attached to the hoist cable. When we entered this dark hole, lit only by an occasional dim light bulb and the flame from the miners' lamps, the momentary panic of leaving my secure life on the earth's surface quickly vanished as the kaleidoscope of an underground world flashed by. The shaft followed the quartz vein in its devious downward path, some places quite flat and others steep. In spots the roof was so low that I had to scrunch down to keep from hitting my head. All during the descent water dripped on us and my nostrils were assailed by stale, dank smells. The shaft had an eerie quietness about it, the only sounds coming from the wheels of the man-truck, the slap of the cable and the muffled conversations of the men.

After the truck had stopped at several intermediate levels to let men off, we arrived at the 4,600 foot station, the bottom of the mine shaft. Leaving the truck, I followed my new boss and some workers for about a quarter of a mile along another dark, wet, smelly passageway containing ore car tracks and mysterious rooms off to one side or another. Later on I learned that these

were either places for storing dynamite, mule barns or where the "honey buckets" reposed. The latter were empty fifty pound carbide cans used as toilets and removed to the surface periodically by "honey nippers," a job not sought after.

We finally arrived at another passageway leading up at a steep angle, containing a wooden ladder and a wooden ore bin. Climbing up this dark hole for about 150 feet, illuminated only by carbide lights on our hats, we came into a large room at the top of the raise. I could see timbers holding up the roof and car tracks going in opposite directions with small wooden cars on them. The shift boss told me that my job would be to load the pile of ore, previously blasted down on steel sheets laid on the tracks, into one of the cars. The shovel handed me had a large scoop and a short handle and I soon found out why. The place where I was to work couldn't have been more than four feet from floor to roof. Someone handed me a pair of metal knee pads and it became obvious that I could only perform my job by kneeling down and throwing the ore over my shoulder into the car. At the end of that first shift my body ached all over, my hands and knees were swollen and sore, and I found it difficult to stand up straight. After a few days working under such tortuous conditions, it suddenly hit me why I had been so "lucky."

The mine foreman fully expected that I would be unable to take such punishment and would quit. I managed to stick it out, gaining a modicum of respect from my fellow workers, while even the shift boss, a grizzled, crotchety old Cornishman, warmed up to me a bit. Nobody had dreamed that many of the muscles needed to muck in such an unnatural position had been developed by pulling an oar on the crew at Berkeley, and I never let on why I lasted. After a month or so, management, deciding that I wouldn't quit, transferred me to another stope where I could stand erect while loading ore into cars.

By the end of that summer, I had pretty well mastered the art of mucking, could roll a cigarette and knew the difference between gold and iron sulphide. I had also learned to understand the peculiar accents and decipher the colloquialisms of the Cornishmen and even made a few friends among the younger ones. Most importantly, the older miner's occasional remonstrances to "take five" or "tap 'er light" signified my gradual acceptance as time went on.

THE MEN, MULES AND MACHINERY OF THE EMPIRE MINE

From the beginning, I noticed many odd characteristics about most of the men working underground. A few had come from the depressed copper mines of Arizona and Montana. Others had drifted in from as far away as Australia, Sweden and Ireland. But the great majority were natives of Grass Valley, descendants of the wave of miners from the shut-down tin mines of Cornwall in the 1870's. I found these Cornishmen, especially the older ones, to be extremely clannish and diffident to strangers like myself. However, they certainly knew how to mine and they taught me an enormous amount of practical knowledge that proved invaluable in my career later on.

The Cornish people had been tagged with the sobriquet of "Cousin Jacks" by locals. The name is supposed to have come because of the great number of relatives each Cornishman could produce to take any available job in the mines. The older miners usually preferred to work with their own kind and they looked with

suspicion upon outsiders as possible company spies. These older "Cousin Jacks" spoke with most peculiar accents and used strange expressions. The first time one of them said to me, "Haw yer seemin'?" I looked at him blankly without the slightest glimmer as to what he meant. Later on, I realized he had said, "How are you?" They loved to tell Cornish jokes, but, at first, I often missed the point entirely, being unable to fathom their idioms. One of their favorite stories involved a recent arrival from Cornwall, quite uneducated but not about to admit it. He was the proud possessor of a watch which he frequently consulted during the work shift underground. One of his fellow Cornish miners, not much better schooled, decided to test the newcomer. "Hey, Jock," he said, "What time ayr ye havin'?" Jock proudly pulled out his watch and held it out for his questioner to see. "There she be, me son," he said. The other one looked at the timepiece intently for a moment and exclaimed, "Damme if she ain't."

The old timers held on tenaciously to their superstitions. They firmly believed that bringing a female underground would precipitate certain disaster. They claimed quite seriously that little people called "Tommy Knockers" worked in the mines and, during quiet spells, they would agree with one another that they heard hammering and drilling off in the distance. I used to

hear noises in the mine too, but they usually came from creaking timbers, dripping water, or the scurrying of rats. The miners felt a particular kinship towards the rats, which lived on scraps from lunch buckets. Legend had it that the rodents would rush out of a working place with loud squeals if the hanging wall was about to cave in. Personally, I preferred to depend on my own senses rather than putting up with those big, brown unpleasant animals. At one time or another, cats had been introduced into the mine in an attempt to control the rat population but even the biggest and fiercest felines proved to be no match for the rats.

The miners, as a rule, vigorously resisted change. On one occasion, the mine Safety Engineer decided to introduce hard hats underground to cut down on head injuries. Some of us workers agreed to try them in place of the soft caps which offered little protection from falling rocks or low hanging objects in the drifts. After only a short trial, the majority of wearers decided they didn't like the hard hats and gave them back to the company. I liked them and when I started wearing a soft cap again, I almost knocked myself senseless bumping into objects that hadn't bothered me at all while wearing a hard hat. Eventually, better judgment prevailed and hard hats became standard apparel throughout the mine.

Cornish people are famous for their fine singing voices and the men's choir from Grass Valley gave concerts at Christmas time throughout the state. I recall hearing beautiful singing by the men on the truck going down to work, especially around the holidays. Some even sang during the shift in the stopes. I remember one little ditty a miner would sing during a lull in the racket from the pneumatic drills. It went something like this:

> When I was young and had no sense,
> I bought me a fiddle for fifteen pence.
> And the only tune that I could play
> Was s--- on a shovel and throw it away.

A sharp distinction existed between a mucker and a miner. The latter had to ensure the safety of the working place before rigging up to drill. He had to place the drill holes in the face to provide the maximum amount of broken ore for the following shift to muck. Handling the powder and the detonators called for extreme caution. Many a miner has met his untimely end either carrying the explosives carelessly, while ramming the sticks of dynamite into the holes, drilling into the remnants of a previous round that didn't completely explode or, after lighting the fuses, having the charge explode prematurely. Additionally, the miner had to carry his drills to the stope, procure air and water pipe and add it

to the existing system as the mining progressed and stash all his equipment in a safe place before blasting. For all these extra chores and hazards, the miner received about 50¢ a day more than a mucker!

Next up the line in importance came the timbermen. They had the responsibility of maintaining the hanging wall in place by setting wood stulls wherever dangerous conditions existed. I always considered them a rather lazy lot and not worth the extra pay they received over the miners' wages. The shift bosses, usually promoted from the ranks of the timbermen, were charged with the duty of getting the ore out from the different sections of the mine so as to keep the mill running. I remember them, with one or two exceptions, as a rather unimpressive group of characters. After I knew him better, I found that "Lammer" Rowe, the mine foreman, stood head and shoulders above all the other underground bosses.

The best jobs by far went to the lucky ones working on the surface as hoistmen, shop mechanics, and mill workers. The mine also employed engineers, assayers, draftsmen, office workers, and, at the top, the mine superintendent and mine manager. Very few of the blue collar workers, if any, ever rose up to the professional job level during my tenure, but there were few complaints

about this pecking order. Most of the miners belonged to a union, but it appeared to do little to further the welfare of its members, being content to accept whatever terms the company offered. Fortunately, union membership was voluntary, so we college students made no effort to get involved in the organization.

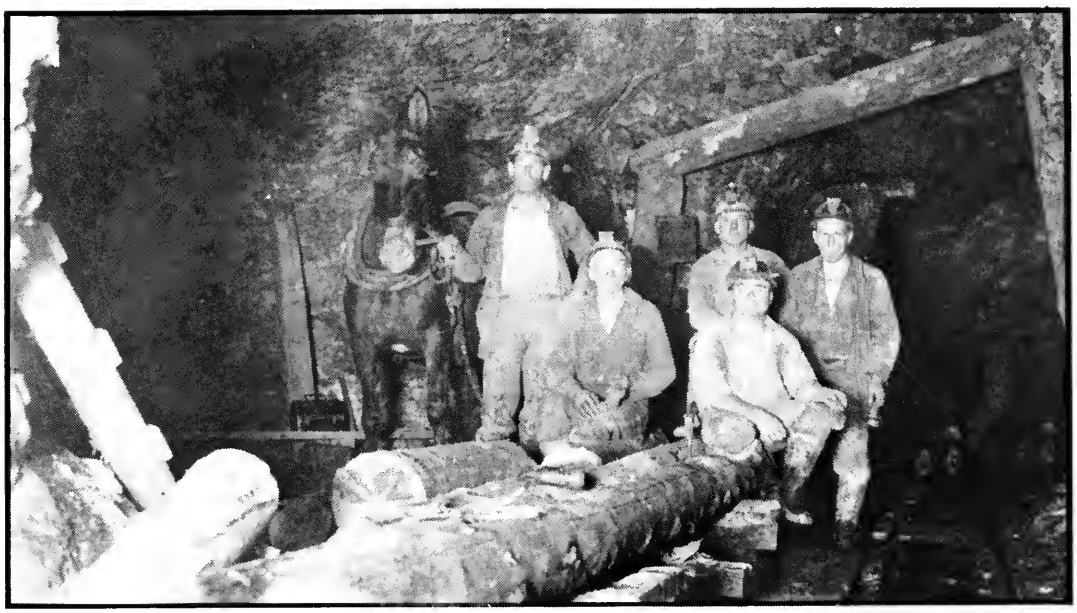
Probably the most famous contribution by Cornishmen to mining is the Cornish Pump, invented in Cornwall and brought to America in the 1880's. It consisted of a string of heavy timbers fastened together end to end extending down the inclined shaft as far as 2,000 feet. On the surface, the timbers were fastened to the rim of a large water wheel or to a steam cylinder. As the wheel rotated, powered by water, or the steam piston moved back and forth, the motion pushed the long rod of timbers up and down on greased guides in the shaft. At frequent levels in the shaft, pump pistons, attached to the timbers, also moved back and forth in pump chambers. This motion forced mine water up from one level to the next in pipes, emptying into sumps, until finally discharged at the surface.

The talented Cornish invented another unique piece of machinery called the "go devil." It consisted of three grooved wheels in a metal frame, attached to a mine timber. When a mucker filled a car, he attached it to a

cable running through the wheels pushing it over the edge and down the raise, controlling the descent by a long rod attached to brake shoes on the wheels. If the operator lost control of the car's speed he had to jump out of the way or be smashed by the empty car coming up the other track. When this happened, or a cable broke, the stope produced no more ore until the mess was cleaned up.

Besides manpower, the most primitive motive force used in the mines of Grass Valley came from mules. These unpredictable and mean-tempered beasts, used for pulling large cars of ore on the main haulage ways, remained there until they died. The men often complained that management cared more for the mules' welfare than for that of the workers. This allegation might have been true, since it cost a relatively large sum to procure an animal, train him or her for the job and provide food and care during its life underground. According to legend, one mule learned to like tobacco and would refuse to work unless supplied with a "chaw." Probably another one of the endless yarns spun by the "Cousin Jacks" for the amazement of the neophyte and the amusement of the initiated. I always managed to maintain a wide berth between myself and the mules, especially after seeing them kick and bite unwary passers-by. Later on in my career at the Empire, I had the dubious privilege of becoming a mule skinner.

By now, the reader has probably decided that my Grass Valley experience consisted of all work and no play. This is far from the case because every one of the embryo mining engineers I met during these years played hard and enjoyed to the fullest the hours away from toiling underground. In the next section, I will describe how we partook of the rather limited opportunities to socialize in our free time.



Timbermen and mule skinner underground at the Empire Mine, 1934.

THE SOCIAL AMENITIES OF A MINING CAMP

The three room apartment Al James and I rented soon became a mecca for college students looking for summer work. At one time, five of us cooked, ate and slept in the very small space but no one voiced any complaints. Finding a job and living as cheaply as possible remained everyone's chief concern.

Grass Valley, in that summer of 1932, boasted one movie theater, one or two passable restaurants, any number of speakeasies and a nice park. We soon discovered that the focus of entertainment centered around Lake Olympia, an attractive spot located between town and Nevada City. The lake provided excellent swimming and sun bathing facilities plus boats and canoes. In the middle of the lake a covered pavilion had been constructed which offered lively dancing on Saturday nights. It became routine for us to attend the dance on Saturday and swim on Sunday. One of our more enterprising roommates would drive out to the dance hall early on Saturday evening and determine what type of stamp was being used for people temporarily

leaving the dance floor. He would then return to the apartment and cleverly carve a replica of the stamp on a potato and, with an ink pad, decorate the backs of our hands with the insignia necessary to get into the dance free of charge. I am happy to report that this Stanford man didn't end up in San Quentin but became a successful Mining Engineer. On some weekends, for variety, we attended the local cinema or tried our luck panning for gold on the Yuba River. We became a familiar sight to the townspeople driving around town in James' Ford convertible. I am sure that many a mother warned her daughter to stay away from those "fast living college boys." None of us became involved with the citizens of Grass Valley that summer except Bill Schwartz, who, failing to land a job in the mine, found employment at the local Safeway store. Bill kept us well supplied with surplus produce during the summer.

By August, I had made up my mind to continue the leave of absence from Berkeley long enough to earn sufficient money to complete school and get a degree. By September, all of my friends had returned to their respective campuses, leaving me to find a permanent place in which to live. This change in my status brought me in very close contact, over the next year and a half, with many wonderful people in the community.

SETTLING IN FOR A LONG STAY

The town had numerous boarding houses catering to miners and I soon found a likely looking one on Mill Street. Typical Cornish people ran it and I rapidly became accustomed to pasties, creamed cod fish balls and saffron cake. I slept on a sleeping porch, always a favorite place for me, and I started gaining back some of the weight lost from the initial work in the mine. Needing transportation, I purchased a used car, the first of a series of "clunkers" that seriously hampered my ability to save money towards school.

The first friend I made in the new circumstances lived with his parents next door to my boarding house. Joe Pirtz had remained out of Cal Engineering School to work in the Empire Mine and recoup his bankroll. Joe and I traveled around together that fall of 1932. I remember coming off swing shift on cold nights with Joe, and he would invite me in for a bowl of hot borscht provided by his mother who had been waiting up for him. The Pirtz seniors came from Yugoslavia and Joe's father had earned

the reputation as one of the best miners in the district. When the nearby Idaho-Maryland Mine ran out of ore, Mr. Pirtz took a lease and found the continuation of the ore shoot. This completely revitalized the property into a major California gold producer.

One evening, while attending a mine safety meeting, I stood next to a tall young fellow as we watched the first aid demonstrations. Suddenly he began to sway and then fell over like a tree. This caused a big commotion, but it gave the safety people a chance to work on a real case and they soon revived him. Later on, I got to know him as Barney Greenlee and our friendship has lasted for over fifty years. Barney had spent some time at the universities of Alaska and Nevada and was then on a leave from Stanford, and, like the rest of us, sought to earn enough money to continue his education.

Soon afterwards I met another fellow worker in the Empire named Glen Fassler who also became a life-long friend. After graduating from the Colorado School of Mines, he married and came West, finding a job and a house in Grass Valley. Glen could always cheer us up with his whimsical humor. I recall one wintry day as Glen, Barney and I sat around the big stove at the collar of the mine waiting to go underground, a miner showed up in his new hard hat which he had painted gold. Taking one look at

the fellow, Glen exclaimed, "Look at the bird in a gilded cage!"

Another Mining Engineer came upon the scene about this time named Ted Johnson. Ted lived in a boarding house run by a French family and he often brought a jug of their homemade wine to the Saturday night dance. The wine had an awful wallop and I can remember the terrible Sunday morning hangovers it left.

The best times of all, though, were with the Greens. Dave and Margaret were both intelligent, well-educated, bon vivants who relished weekend parties. Margaret's nephew had a weakness for blonde show girls and he occasionally brought one up from San Francisco for a jolly weekend. These often turned out to be memorable affairs, aided and abetted by their understanding landlord.

As the work underground became more and more routine, and the parties and good times away from the work increased in frequency, I found myself thinking less and less about returning to school. Another and much more powerful reason for this changed attitude cropped up when I became involved with a young lady.

A YEAR OF DECISIONS

My serious thoughts about giving up the pursuit of an education and remaining in Grass Valley probably would never have taken root if I had not met Mae. Late in the fall of 1932, at a Saturday night dance, I saw her sitting demurely along the dance floor and asked her for a dance. Soon we started dating and I found myself smitten by this comely daughter of an old California family of Scottish descent. Mae lived with her folks on a small farm outside of town, near Rough and Ready. We used to explore the old townsite, trying to imagine what the place looked like when some 40,000 people lived there and it almost became the state's capital. It was this time that I came closest to becoming a permanent resident of Grass Valley.

Mae's older sister, Grace, had married a farmer and lived in nearby Brown's Valley. By the Spring of 1933, farming had become a losing proposition for them so they moved into a large house in Grass Valley. To help cover expenses, Grace offered to take me in as a boarder.

Since the fare and ambience of my current abode had deteriorated markedly, I gladly accepted her offer. Checking with Greenlee, I found him also amenable to a change of boarding houses, so we both moved in. The change proved to be a great improvement over our previous accommodations. Grace was an excellent cook, her husband a jolly host, and we became like members of the family.

The spring and summer of 1933 passed quickly while the emotions of young love still surged through me. However, I had not increased my status as a mucker in the mine, still earning only $3.83 a day, an income that just about covered my living and entertainment expenses! I could not justify getting married on such a pittance and I had saved very little towards returning to school. It was a quandry, indeed.

Then, out of the blue, Lady Luck smiled on me, not once, but twice. Greenlee had returned to Stanford that fall, giving up a job on contract with a marvelous character named "Scotty" Partington. Instead of the miniscule mucker's wages, the job paid up to $10.00 a day, depending on the monthly progress made in the cross-cut. "Scotty" kindly asked for me as a replacement and, when they put me on the contract, I was overjoyed. The other stroke of good fortune came when Mae started dating a local lad. I am sure that her intuition told her I would

always have regretted abandoning my pursuit of an education by getting married and staying on as a mucker at the Empire. From that time on, I had one goal uppermost in my mind: to return to the University of California for the 1934 spring semester.

Contract work was very demanding and I earned every penny of the extra pay. Fortunately, "Scotty," the miner, his helper, and I, the mucker, worked well as a team. Over the next few months, I enjoyed many a pleasant evening with the Partington family and learned much of the lore of mining while sitting around their dining room table. Good people of Grass Valley, like the Partingtons, made life far more interesting and the hard work underground much more bearable.

As a topping to all this good fortune, Newmont declared a $50.00 bonus for all employees at Christmas time. Finally, on a red letter day in January, 1934, I took off for Berkeley in my old Dort convertible with high hopes and the well wishes of many of my fellow workers.

That year and a half spent working underground saw me grow from a youth without any definite goals in life to a more mature person who, with the help of providence, managed to make the finishing of his formal education top priority over any other lesser objective. Some pretty big hurdles still lay ahead, but they never again seemed so insurmountable as they had in the past.

MORE INCREDIBLE GOOD FORTUNE

The College of Mining at Berkeley had managed to get along quite well without me during my leave and my return to academia went virtually unnoticed. Many of those whom I had known as freshmen and sophomores had graduated and the new crop seemed woefully young and immature. I settled into a pleasant hotel-boarding house on Hearst Avenue with a fellow student whom I had met in Grass Valley. He was a non-engineering major and not inclined to do much studying. Predictably, this alliance dissolved about half way through the semester and I continued living in the place by myself. Early in the school term, I discovered the newly-founded student cooperative, Barrington Hall. By eating my meals there while remaining in the hotel, my living expenses declined noticeably. Barrington served excellent food and the students living there were a most congenial group.

Before the school year ended, I began looking forward with keen anticipation to returning to Grass Valley. Two of my newly made friends in Mining, Bill

Hellier and Roscoe Smith, wanted to try their luck in finding work at the Empire, so we agreed to meet in Grass Valley shortly after the end of school in May of 1934. Meeting as planned, we decided as an economy measure to purchase some equipment and camp in the woods outside of town. After getting established as campers, we headed for the Empire Mine, full of high expectations. I introduced my companions to Fred Nobs, this time being careful to check in with Bill Rowe as well. They both greeted us affably, but large numbers of men still sought work, so we became three more faces among the job rustlers.

After a few fruitless days of checking the job situation, someone told us that a local Japanese farmer needed his fruit trees pruned. None of us had ever tackled such a job before, but, with our money dwindling rapidly, we applied for the job so convincingly that the farmer hired us for 25 cents an hour each. Somehow or other, we learned the art of tree pruning in record time, with the kind assistance of the Oriental and that week's work kept us in food.

Then came another one of the breaks that characterized my Grass Valley experience. Nobs called me into his office and offered me a job as a member of a crew being sent by Newmont to sample a gold-quicksilver prospect in the Coast Range Mountains. I naturally leaped

at the opportunity and spent the next two weeks on a most interesting assignment. We headquartered at Wilbur Springs, a posh health resort near the jobsite. We ate sumptuously, bathed in the hot mineral waters and played croquet with the other guests. Incidentally, I worked every day, cutting samples of the various faces in the tunnels and periodically taking the sample sacks in my car to the railroad station at Williams for delivery to the assayer in San Francisco.

Upon returning to Grass Valley, I discovered to my delight that Nobs had given my friends a job cutting a fire trail around the mine property. He had also told them they could move into a small cabin on the mine grounds, formerly the home of George Starr's chauffeur. I moved into the cabin, joined the fire trail cutting crew, and waited for a job to open up in the mine.

Finally, one day Bill Rowe came by and told me to report for work underground the next morning. Once again I donned my diggers, filled my lunch bucket and showed up ready and eager to go to work in the mine. The reception this time by the miners and the bosses was infinitely more cordial than two years ago. It made me feel very glad to be back among these extraordinary people, whom I now knew and appreciated far more than when I first came to Grass Valley. Shortly afterwards, my two friends from Cal went

to work in the stamp mill, setting us up for the remainder of the summer.

ONE INDIAN AND THREE BEARS

Barney Greenlee soon showed up, went to work in the Empire and moved into the cabin with us. Despite the keen rivalry between Stanford and California, the four of us hit it off extremely well. We established schedules for cooking meals, washing dishes, putting up lunches, buying food in town, etc., which produced a smooth-running establishment. The mine reservoir became our swimming pool as long as we kept it clean and we had access to the shops for repairing our automobiles. The mine engineer, Bob Cannon, and his wife, had us to dinner, as did Dave and Margaret Green. Before the latter couple left for Placerville and a better job for Dave, we cooked a dinner for them at the cabin. Except for Hellier's leaving a pot holder in the oven where he was baking a cake, the meal turned out to be a highly successful affair. Later that summer, Bill's mother and younger brothers came to the area and camped at Lake Vera, a lovely spot near Nevada City. I can vividly remember a delightful cookout with the four of us and the Hellier family one balmy evening at

the lake. They moved on to Lake Tahoe and Barney and I visited them there one weekend, taking in a dance where we found three females to every male! Those were truly times to fondly remember.

The highlight of the Grass Valley social season that summer centered on the marriage of Bonita Nobs and an engineer working for the mine. We attended the gala reception on the magnificent grounds surrounding the family home and thoroughly enjoyed the plentiful food and drinks. The next day, Mrs. Nobs sent an enormous platter of sliced ham, cheese and cold cuts left over from the party to our cabin. For the next couple of weeks our lunches tasted like they had been prepared by a caterer.

One long weekend, Greenlee and I decided to drive to Sierra City to visit Glen Fassler who had moved there with his family to a better mining job. We attended the Saturday night dance at nearby Downieville and, towards midnight, I decided to get some sleep. Leaving the dance hall, I climbed into the back seat of what I thought was Fassler's car and promptly fell asleep. The next thing I knew, a hot sun awakened me, still in the back seat of a strange car, parked in an unfamiliar driveway. Climbing out of the vehicle, I found my bearings and started walking up the highway to Sierra City. No one offered me a ride, and I arrived at the Fassler home in mid-morning,

one weary, bleary-eyed sight. Instead of sympathy, all that greeted me were roars of laughter at my plight. It seemed that when the dance ended, no one could find me, so they took off, leaving me to my own resources.

That afternoon Barney and I left for Reno to visit some friends he had made while attending the University of Nevada. A few miles out of Reno, on a long down-grade, the old Dort really flew until we heard the engine knocking badly. Limping into town, we put up at Barney's friends' place. Luckily, we scrounged some used parts and good mechanic Greenlee got us going again the next morning. On the return trip, we sailed along uneventfully until we reached the foot of the Donner grade. There, the engine gave out a loud bang and we stopped dead with a broken crank shaft. We telephoned one of our mutual friends in Grass Valley, Throp Jones, who generously drove up to where we had stalled and towed us back home. For some reason, Jones had brought a very short tow rope and he spared no time getting back to Grass Valley. That is one trip neither one of us is likely to ever forget! In a week or so, again with Barney's help and the use of the mine shop facilities, we managed to get the Dort running once more. On my way back to school that Fall, I traded it in for a 1928 Chevy convertible, one of the best cars I ever owned.

Roscoe Smith, "Smitty" to his friends, owned an ancient Model T Ford which he loved to tinker with. He purchased a Chevrolet transmission and installed it, along with a Ruxtle axle, on the Ford. The resulting vehicle defied all description. "Smitty" could shift this amazing creation of his into a dozen or more different gears. At the highest gear ratio, the engine barely turned over while the car sped along the highway at more than sixty miles an hour. The four of us decided to try the car out on another long weekend and visit the Greens in Placerville. The contraption had no top, two sat in the front seat, two on a box in the back, facing the rear. People became convulsed with laughter when they saw this thing coming down the road. But, when "Smitty" put it into high gear, we whizzed by much bigger and more modern cars, leaving the occupants with startled looks on their faces. We arrived without incident at the Green's place, enjoyed one of their famous parties and returned to Grass Valley wind-blown, tired, and happy.

Towards the end of the summer, I received a promotion from mucker to miner, a real bonanza, since it paid about 50¢ more per day. I experienced some nervousness at first with such a responsible job, but my shift boss, George Day, one of the best in the mine, counselled me with good advice and encouragement. Soon I

could drill a respectable round, load the holes with powder, light the fuses and produce a good pile of ore for the next shift. The miner on the opposite shift in my stope used to leave sarcastic notes for me, claiming my rounds were puny, leaving his muckers short of ore. I never met the character, but I assumed he didn't approve of a "college punk" holding down a miner's job. The mine bosses did not criticize my work, so I just ignored his pettiness and continued to polish my skills.

One of the most frequently discussed topics, both underground and on the surface, concerned the stealing, or the euphemism preferred to the miners, "high grading" of gold and gold ore. Other than in the first stope where I began my career as a mucker, I never worked in a so-called high grade place in the Empire. This could have been a blessing in disguise because things went badly for anyone caught attempting to take gold from the mine or mill.

THE FINE ART OF HIGH GRADING

Ever since the advent of gold mining and milling, the precious metal has been stolen by dishonest employees. There seemed to be an unwritten code among them that any gold found belonged to them and not to the company. Even placing trusted employees in rich working places often failed to curtail the practice. At the Empire, one of the best sources of high grade was in the waste gobs, enriched by pieces of gold ore from blasted rounds. Older men customarily worked the gobs, shoring up the hanging wall behind advancing faces, and, as might be expected, these jobs were highly prized. The men used to joke that the worst high-graders posed as pillars of the local churches, sitting in the front pews on Sunday, and devoutly singing hymns!

Mine management constantly devised rules and regulations to try to minimize the theft of gold and gold ore. At the end of each shift at the Empire, lunch boxes had to be left for inspection on a table at the entrance to the change room. In addition, everyone was required to

leave his work clothes in a locker and change to street clothes. Not too long after starting to work, I noticed that the miner using the locker next to mine always wore two-piece long underwear, both underground and on the surface and he never took a shower. After I had gained his confidence, some two years later, he explained his peculiar habits to me. Beneath his underwear pants he carried a canvas bag strapped around his waist. During each shift he filled the sack with gold ore and, by removing his underwear bottom, but not the top, he would then put on his street bottom, remove the work top and get into his street top without the contraband ever being exposed. Dressing next to him for a year and a half, I never once suspected that he was a high-grader. The shift bosses must have known all along what was going on under their collective noses, but, from what I could see, they did little or nothing about it.

One of the many marvelous legends I heard about high-grading concerned George Starr and his efforts to stop the practice. In order to recover the free gold, the pilfered ore needed to be finely crushed before mixing with mercury, which formed a gold amalgam. After that, it became fairly routine to burn off the quicksilver as a vapor, leaving the gold to be sold to ever-present buyers. For those in the business of stealing large

quantities of rich ore, a small, power-driven crusher was a must. Starr discovered that these crushers came to the local freight station, neatly boxed with the recipient's name stenciled thereon. By regularly checking the depot, Starr would note the names on the boxes and, if he found any Empire employees receiving the machines, they were fired without further ado. Not to be out-foxed, the high-graders turned to selling the ore directly to the dealers. This, of course, involved the risk of not receiving the true value of the gold in the rock. One miner friend confided to me that he averaged $20.00 a day from the proceeds of the sack around his waist. When one recalls that his pay amounted to $4.50 a day, it is easy to see how he could live in a nice house, drive a fine car and put two daughters through college!

We engineering students who realized the folly of stealing gold, avoided the career-ending calamity that happened to one unfortunate Empire Mine employee during my employment there. This chap had achieved the ultimate in trust by being allowed to assist in the smelting down of the amalgam from the stamp mill and the pouring of the molten gold into bricks prior to delivery to the mint in San Francisco. The temptation to steal small amounts of the gold-rich amalgam became more than he could resist. His downfall came when both he and his wife commenced

living far beyond his modest salary. He started coming to work in the finest of clothes, purchased an expensive automobile, and his wife suddenly was decked out in a new fur coat. It didn't take management long before they began watching him closely and finally catching him "red-handed." He was promptly fired and other area mine owners were notified of his illegal activities. Those ill-gotten gains could be truly called "fool's gold."

It might be postulated that we embryo mining engineers remained honest because, with that sack of ore, we would not have been able to take that very welcome shower at the end of each shift. But the most compelling reason, in my judgment, was how well we were treated by the Empire Mine people and how difficult it would have been to continue the pursuit of an education without the jobs they gave us. In the final paragraphs of my story, the benefits from this generosity became more and more apparent.

A GOAL IS REALIZED

During the 1934-35 school year, I roomed with the only Nobs son out of four who didn't attend Stanford. Stanley Nob's interests lay in the arts, far afield from the engineering careers that his father and brothers followed. Stan and I hit it off real well. We worked together hashing in a hamburger joint in Berkeley and he induced me to try out for the Cal track team, where Stan participated as an excellent high jumper. That Christmas vacation found me back in Grass Valley where I went to work almost immediately at the Empire. Another classmate accompanied me this time and we both lived in the cabin together. Art found a job in the Pennsylvania Mine and we soon settled into the usual routine.

A rather bizarre incident occurred that December. One afternoon, as we prepared for work on the swing shift, we heard a loud explosion come from the mine shaft. Hurrying over, we could see smoke billowing out of the collar and people milling around. The mine Safety Engineer spotted us and, finding that we both qualified as

members of a mine rescue team, asked us to participate. Along with other team members, we donned oxygen breathing apparatus and boarded the man truck preparatory to descending into the shaft. Just then, word came up from the mine that a miner on the 1500 foot level had committed suicide by sitting on a box of dynamite and setting it off. Since the explosion didn't endanger any of the other miners underground, the rescue effort was cancelled. A photographer from the local paper had taken our photograph while we were on the man truck and it appeared on the front page of the Sacramento Bee the next day, along with the graphic story of the suicide.

The remainder of our working vacation passed quickly and uneventfully, high-lighted by a delicious dinner with the Nobs family and a couple of Saturday night dances at the local pavilion. Once again we received that welcome $50.00 Christmas gift which helped defray costs at Berkeley.

The Spring of 1935 will always stand out in my memory as the toughest time I ever experienced academically at Cal. I attempted to carry too many units while holding down two part-time jobs, as well as indulging in a full social calendar. The worst part of the year came at the end when I had to attend summer surveying camp for six weeks. This, I feared, would

sharply curtail my ability to earn enough money in Grass Valley to see me through the fall term. Again, lady luck smiled. One of the members of my survey party brought along a Friden calculator, enabling us to finish the course in five weeks, all receiving A's for our efforts.

After survey camp, I headed for the mines in my Chevy and found work at the Empire in a day or two. The cabin had now become the home for some new faces from Cal and Stanford so my bed ended up outdoors. This didn't bother me, except for the incessant roar of the stamp mill all night and the playful antics of "Truck" Dellinger, a goldfish swallower from Stanford, who delighted in turning my bed over in the morning while I slept after having worked the night before on swing shift.

Once again I had the luck of the Irish. By this time I had become quite friendly with that old curmudgeon, Bill Rowe. His favorite nephew, Carl Lambert, had entered Cal in the College of Mining, so Rowe now looked much more benignly on college students. A contract came up about this time and Bill gave it to me. It was in a nasty, gassy, crosscut drift that caused my predecessor to quit. (Was he still testing me out?) My job consisted of loading waste rock into large cars until I had a total of six. Then I went to the mule barn, lead the ornery beast into the drift and hooked him up to the train of cars.

After much whistling, shouting and swearing on my part, the mule would finally decide to pull the cars out to the shaft for me to dump them into the waste pocket. That smart animal sensed my fear of him, and would lean on me and squeeze me against the walls of the drift every time I had to pass by him. Bites and kicks came regularly whenever I ventured within range of his mouth or feet. I tried bringing choice tidbits down from the surface for him to eat but nothing placated him or abated his vile temper.

The remainder of that summer saw me do little else but work, eat and sleep, but the good contract pay I earned made the tough routine well worthwhile. This windfall enabled me to thoroughly enjoy my senior year at Berkeley without having to take on odd jobs. This, in turn, helped my grade point average considerably and allowed me to engage in extra-curricular activities that help to round out a college career.

The Christmas vacation period found me again working in Grass Valley, this time at the North Star Mine. I really enjoyed the change of scenery and the opportunity to work with a new group of Cornishmen. I saw the famous Cornish pump in action--something one had to see firsthand to believe that it could work as well as it did. I signed on as a miner even though I had never

worked in the North Star before. I guess my friends at the Empire put in a good word for me. No one from school had accompanied me so I lived in a boarding house in town. A couple of Stanford graduates working in the Idaho-Maryland Mine stayed there also and we engaged in many lively conversations at meal times. We again received the annual $50.00 bonus from Newmont which sent me back to school for my final semester in a jovial mood.

My standing with the Dean of the College of Mining, Frank Robert, had risen considerably as my grades improved and as I became more involved in non-academic activities, something he approved of highly for all would-be engineers. One such event, however, almost ruined my increased stature in his estimation. The annual Engineers' Day gave us mining students a chance to demonstrate our prowess to the rest of the campus. I was selected to set up a drill and put in a round of holes in the Lawson Adit, a tunnel excavated by students, past and present, into the hillside behind the Hearst Mining Building. I had just completed setting up the machine preparatory to drilling the first hole in the face of the adit. As I turned on the compressed air to the drill, Dean Probert came around the corner of the tunnel to check the action. A blast of air, water and oil mixture from the machine's exhaust hit him squarely in the face,

ruining his high white collar and my career as a Mining Engineer, or so I thought. He slowly wiped himself off as best he could, gave me one of his famous glares, turned around and left the scene without saying a word! To my great relief, nothing ever came of the unfortunate incident.

After graduating in May of 1936, I visited Grass Valley once again in search of a job, this time in an engineering capacity. The prospects looked slim, so I left for other mining camps, never to return except for short visits with old friends. I felt that I had graduated from this marvelously practical school, the Empire Mine, and now my future lay in other mines and in other places.

The famous mines of Grass Valley and the miners who worked in them are almost gone now, but their stories will be told and re-told to generations to come. My grandfather participated in the birth of hard-rock mining in California and watched it grow into an extremely important industry, both for the state and for the nation. I happened upon the scene when gold mining in California reached its apogee, bringing prosperity to mining camps like Grass Valley amidst a fearful depression. Then, almost overnight, as World War II ravaged much of the earth, the mines produced no more. My

story encompasses the beginning and the end of an epoch unlikely ever to be seen in California again.

A TEACHER FOR ALL REASONS

Thinking back over my school years evokes many pleasant memories of those instructors who influenced my life each in his or her own way. However, there is one who stands out above all the rest of that group of dedicated, capable teachers.

Walter Weeks, a Professor of Mining Engineering at Berkeley, exemplified just about everything one could hope for in a teacher. Short and somewhat portly, with balding gray hair and given to wearing baggy tweed suits, "Wally" to his intimates, possessed an aura of quiet dignity. Yet, when the occasion demanded it, he could unleash an acerbic tongue, such as when a student displayed sloppy work or thinking. I recall once in his class on Mine Ventilation, my dumb answer to his question earned this reply, "Come on, Downey, button up your brains." One day in the machinery laboratory, one of his prize pupils carelessly left a pile of loose notes on the floor. Someone turned on a large fan and Fred's papers went flying all around the room, some landing in a pan of

oil while others got chewed up in the fan blades. Professor Weeks bawled the unlucky student out unmercifully. In the tool sharpening shop, after heating the drills in the forge, we hammered them into the desired sharpness and hardness. One day, in a playful mood, several of us started to sing "The Anvil Chorus" as we pounded the steel. Just then Weeks entered the room and observed sarcastically, "Well, I see we have some would-be opera singers while all along I thought you might have the makings of Mining Engineers."

Despite this austere exterior, Professor Weeks had another side almost completely opposite from the one he showed in the classroom. At the end of each semester, the Mining Association, composed of students in Petroleum, Geology, Metallurgy and Mining sponsored a farewell dinner for graduating seniors. These gatherings, held at Bertolli's Italian Restaurant on Telegraph Avenue, gave us a welcome respite from the rigors of the classroom. Each party featured a skit written by Professor Weeks and acted out by students with thespian abilities. These plays inevitably proved to be the high point of the evening. Weeks also wrote poetry about grizzled old prospectors and other characters typical of the mining fraternity. Before the evening ended, the students always called upon him to recite one of his rhymes, the favorite being one with the

enigmatic title of "The Ballad of Two Portal Bill."

After these times-out for levity, the next day things returned to normal in Week's classes and woe to the student who failed to respond correctly to his penetrating questions.

Another side of Walter Weeks became known to most of us after we had graduated. He delighted in attending the annual outing at the Bohemian Grove and many of the plays and skits performed there each summer came from the pen of this multi-talented son of Harvard University.

Displayed in a room in the Hearst Mining Building on the Berkeley Campus is a collection of photographs of individuals and events from each class going back almost one hundred years. Among my Class of 1936 pictures is a rear view of Professor Weeks on the steps of the Mining Building, baggy pants and all, talking to some students. Beneath the photo is the neatly lettered caption, "The Seat of Learning." To those viewing the picture, the humor is evident, while the appropriateness of the words is undeniable to those of us who knew him as a teacher and a friend.

THE NIGHT THEY STOLE THE SENIOR BENCH

The time was in the early Fall of 1935. We Seniors in the College of Mining thoroughly enjoyed our exalted status in that mysterious and male-dominated part of the University of California campus. We rarely made incursions into other areas of the school, such as Wheeler Steps, Sather Gate or Stephens Union unless a non-engineering course required it.

Such a subject was included in the curriculum for Mining Engineering. Called Mining Law and taught by a tough, demanding mining lawyer named Colby, who had earned the sobriquet of "anthracite" because the student lawyers, who also took the course, considered him very hard. They also referred to him as "shotgun Colby" for his predilection to give unannounced quizzes. As the semester progressed, we miners began enjoying the class more and more. When Professor Colby used terms like "stope," "square sets," "dip and strike of the vein," we knew exactly what he meant, but they sounded like pure Greek to the legal neophytes. Most of the miners received "A's"

while the law students considered themselves lucky to get off with "C's" or "D's."

From this exposure to the non-engineering parts of the campus, we became well acquainted with that venerable old structure known as the Senior Bench. Solidly constructed of redwood, it sat majestically across from Wheeler Hall, proclaiming by a brass plate that only Senior Men could sit on it. Being of that genre, I took to resting on the bench before or after those pleasant hours with the legal set. However, to my dismay, I soon noticed that the hallowed tradition, more often than not, supported the posteriors of little old ladies, fidgety children, or even worse, lowly Freshmen!

One warm Autumn day, as my classmate Conrad Thomas and I reposed upon the bench amidst this motley assemblage, suddenly a brilliant idea hit us, or so we thought at the time. Why not somehow move the bench to the circle in front of the Hearst Mining Building? There it would take its rightful place and support the bottoms of only the male sex, even if not all Seniors.

Sitting there, we conjured up an ingenious plan that, if it worked, would be considered masterful. Physically moving the monster seemed to present our most serious problem. It measured about 30 feet in length and judging by the size of its members, weighed at least a ton

and perhaps much more. Happily the Fall meeting of the Mining Association was coming up and this provided the answer to the motive power. We would recruit the 50 or more attendees to the evening affair to pick up the bench and walk it to its rightful location.

My co-conspirator and I soon went into action. Sitting on the bench, we surreptitiously sketched its shape and obtained key measurements between its supports. We decided that it would somehow have to be fastened down once we got it to the Mining Circle. We solved this problem by planning for "deadmen," installed at the site during the evening of the move, with iron tie rods protruding, which would be bolted to the bench's supports. Then the buried deadmen would be concreted in place. This way, we reasoned, removing it would present a very tough problem to any would-be rescuer without dismantling it completely.

Procuring the necessary materials for the anchors presented no problem. But finding a source of quick-setting concrete to be delivered around 10 P.M. was another matter. One of our classmates had a roommate in Civil Engineering with access to the concrete laboratory. We divulged our plans to them both and the C.E. promised to deliver the concrete at the appropriate time and place. We were later to regret ever having relied on this

outsider.

The night of the big lift arrived and everything looked propitious. We had established that the Campus Police made their rounds about 10:30 P.M. and again at 11:30. We calculated that this hour would give us ample time to carry the bench from Wheeler Hall to the Mining Building and anchor it in place. During the Mining Association meeting, two of us dug holes in the selected spots and installed the deadmen with tie rod bolts carefully set to fit the bench supports, all ready for the promised concrete.

Just before the meeting ended we announced our ploy. It met with enthusiastic response and at about 10:40 P.M. some 50 students from Mining, Metallurgy, Petroleum and Geology Divisions started out in small groups of 2 or 3 to rendezvous at the Senior Bench. Imagine if you can, this scene of dark desolation surrounding the site, when suddenly a half hundred figures emerge from the gloom!

The moment had arrived for which we had planned and schemed for more than two weeks. Could the bench be lifted and carried bodily almost a half mile to its final destination without being intercepted by the police? At a signal, we each grabbed onto a part of the great wooden symbol, lifted it into the air and began marching slowly

toward the Mining Circle. The only sound in the night came from the rhythmic beat of footsteps and the deep tones of the Campanile as it tolled 11:00 o'clock.

We reached the Mining Circle without incident, exhilarated by our temerity. Setting the enormous load carefully down, we quickly drilled holes in the legs for the anchor bolts to pass through. During this operation, I walked over to the eventual resting place of the bench to inspect the concrete placement. To my consternation, I found only the holes containing the deadmen but no concrete! A hurried check disclosed that the Civil Engineer who had promised to deliver the concrete explained that he had been unable to procure this essential ingredient to our plot. Later, we agreed among ourselves that the C.E. had "chickened out" at the last moment.

We did the best we could after this unfortunate turn of events, by bolting the bench down and covering the anchors with dirt and then scattering to our living places. Shortly after midnight, someone gave the alarm that the Senior Bench had disappeared. California and St. Mary's were to play football the next Saturday, so naturally the theft was attributed to the students from Moraga. After much confusion and aimless running around until the small hours of the morning, the Rally Committee

finally located the bench where we had taken it. Finding it securely fastened down, with their usual heavy-handed method, they brought in a truck, tied onto the bench, pulled it out of position and dragged it back to Wheeler Hall. In the process they dug up the Mining Circle lawn, uprooted shrubs and left the poor old bench in a sad state of disrepair.

Who knows if our scheme would have succeeded if we had been able to concrete the bench in place? The Rally Committee would still probably have hitched on to it and pulled it completely apart. The episode raised a bit of campus hue and cry and speculation, but no one could ever positively identify the culprits.

Today, on the campus in front of Norris Hall stands an anemic replica of the once proud symbol reserved for Senior Men. I haven't checked lately, but this poor substitute for a great old tradition probably also harbors little old ladies, children and Freshmen, but few, if any, male Seniors.

RACIAL PREJUDICE COMES WITH THE TERRITORY

Early in the Spring of 1937, brimming with confidence, I left San Francisco for the Arizona Copper Mining District in search of a job. I had learned that Kennecot Copper Company's operations in Ray would be a good place to start. As I drove east towards Arizona, my naivete about places and people would soon be revealed and some pre-conceived ideas drastically changed.

My first surprise came when suddenly before me lay miles of all varieties of wild flowers and blooming cacti. This certainly didn't look like the desolate desert I had pictured in my mind. As the verdant vistas continued, I congratulated myself for having chosen such a lush landscape to pursue my career in mining.

This euphoria lasted until my first glimpse of the town of Ray. With many of its buildings unpainted and leaning against each other for support, braying donkeys wandering loose up and down its one street, the place looked most uninviting. Then I realized that the mine had just been re-opened after a five year hiatus during the

worst of the depression, which would account for the widespread dilapidation. Girding up my sagging spirits, I found the main office and presented myself ready for work.

Once again came keen disappointment. The personnel manager informed me that he had a waiting list of over 100 Mining Engineers also seeking jobs. While I sat mulling over this depressing news, the mine manager entered the room and the personnel man introduced us, explaining my situation. Then they left the room together for a short period, asking me to wait. The head of the personnel department returned alone smiling broadly. "Well, Downey," he said, "you certainly timed your visit well. Mr. Thomas, the Mine Manager, was about to have me contact one of the names on our list to fill a job which has just opened up. Since you are already here and he liked your looks and résumé, he authorized me to offer you the job." These good tidings made my world rosy again and I promptly signed on as a Junior Mining Engineer.

The following day, I reported for work at the mine office and met my new boss, the Mine Superintendent, a hard-nosed veteran of isolated camps in many parts of the world. I then learned that except for the bosses and my fellow engineers, all of the men working underground were Mexican. The prospect of being in a small minority of whites among several hundred non-whites caused me

considerable anxiety. Any prejudices I might have harbored toward minorities had never surfaced but this situation could trigger latent animosities with concomitant unpleasant consequences. However, all my fears proved to be unwarranted. After a few weeks on the job, I began to feel completely at home with the Mexicans. They performed their tasks with extreme competence, and when they learned that I wanted to speak their language, they took up teaching me with great enthusiasm. Most of them spoke English reasonably well, but they preferred their native tongue. Making the effort to learn Spanish helped me overcome the barrier that I found existed between the miners and some of the whites. The Mexicans, for the most part, exuded a fun-loving, carefree outlook on life, were devoted to their families, and extremely loyal to their adopted country. They loved to play jokes on newcomers and I became the butt of one of their favorites. One of them offered me a chile pepper from his lunchbox. I managed to get it down, then ran for the nearest water fountain to extinguish the fire, followed by their howls of laughter.

The Mexicans all lived in a pretty little town called Sonora, over the hill from Ray. One day, needing a haircut, I sought the local barber only to find him off on one of his frequent binges, so I decided to try the

Mexican barber in Sonora. Entering his shop, which contained a number of chattering locals, all talk ceased as they eyed this "gringo" trespassing on their domain. But when I indicated in broken Spanish and gestures my desire for a haircut, they soon continued their animated conversations as the barber skillfully trimmed my locks.

I became very friendly with one of the miners, an unusually large and intelligent fellow named Roberto. Sometimes after swing shift, around 1:30 A.M., I would drive over to his house in Sonora, where his wife would be waiting with a typical meal of refried beans and tortillas or tacos. After we finished eating, Roberto would take out his twelve-stringed guitar and play and sing the hauntingly beautiful melodies of his native land. These were some of the best hours I ever experienced while at Ray. However, a company executive told me that fraternizing with the Mexicans was frowned upon by management and it would be better for me if I discontinued the practice. Such blatant intolerance caught me completely off guard and thoroughly dismayed me. I soon made up my mind to leave Ray and move on to other mining camps where perhaps such attitudes didn't exist. Besides, by now the searing summer sun had withered the landscape so that it resembled the desert I had first expected to see. The artificial distinction that existed between

whites and Spanish speaking people in Ray has mostly disappeared in mining camps in this country. Unhappily, it still colors relations in South and Central America and the Philippines. Whether such discrimination will ever be completely eliminated is questionable. This is unfortunate because it keeps whites from discovering, like I did, how warm, generous and friendly people with different colored skins than ours can be.

I didn't find the obvious discrimination exhibited at Ray in future mining camps, but I did run into a more subtle and perhaps more deadly type of prejudice at times as described in later chapters.

UP THE LEARNING CURVE

A statement made by the Dean of the College of Mining proved to be a prescient one. He told his students that the first ten years out of college would be a period of finding out what we wanted eventually to do and the second ten years learning how to do it. So, after a year working in the copper mines of Arizona, the entirely different mining country of Idaho became my destination.

Upon awakening that first morning in my hotel room in the lead-zinc smelter town of Kellogg, Idaho, my mouth tasted like sulphur. Then it dawned on me that this normal condition came from the fumes given off by the nearby smelter. That convinced me then and there to never accept a job in or around a smelter. Later in the day the mining company officials told me they needed an assayer for a small gold prospect just starting up in central Idaho. The offer sounded interesting so I became an employee of The Bunker Hill and Sullivan Mining Co.

After a long, tedious ride, the bus arrived at the very small town of Dixie, Idaho. As I got off the bus

it looked to me like the very end of the earth. An employee from the mine met me and we continued in a truck for about 5 miles through heavily forested country to the mining operations. Looking over the surroundings, it struck me as probably one of the most isolated spots in the Western U.S.A. But once ensconced in my snug little combination assay office and sleeping quarters, it soon made up for the lack of the trappings of civilization.

My job involved collecting daily ore samples from the mine and crushing them on a buck board, a contrivance for which my schooling had failed to train me. It consisted of a heavy piece of half rounded, closed steel plate, about 6 inches wide and equipped with a wooden handle. When placed upon the ore samples laid on a very stout steel table and rocked back and forth vigorously, it crushed the rock down to the proper size for assaying. Not as convenient as the dandy little electric crushers we had in school, but it served the purpose. Besides, the electricity from the diesel generator had to be conserved for more important uses. The remainder of the day found me in front of a hot assay furnace determining the gold content of the samples. Winter comes early in Idaho and with it periods of very heavy snowfall and bitter cold winds. Consequently, the warm assay office became one of the most comfortable places in camp.

Other than reading and listening to the radio, our entertainment consisted of whatever we could come up with. I found one miner who loved chess and we spent many long wintery evenings playing this mind-challenging game. I tried to ski, but after numerous falls and losing my glasses in a snow bank, I decided that the sport wasn't for me. Once a week, weather permitting, a worker hitched up the mine horse to a sled and drove to Dixie for the mail and supplies. I went along a few times just to break the monotony. The horse had small snow shoes fitted on each foot and had no trouble traveling over the six feet of snow covering the ground. One Saturday night, a group of us took the horse and sled into town for the monthly dance. A couple of old-timers played Virginia Reels and Hoe Downs, a dance form untried by me before. But after observing the techniques for awhile and fortified by a beer or two, I danced with the local school teacher and other ladies of the town, quite proud of my new-found terpsichorean ability.

The Mine Manager, a rather dour Englishman, had instructed the Chinese cook to always boil beef for dinner. After a month or so of this bland fare, most of us longed for a serving of rare roast beef or a tasty, juicy steak. One day I stopped by the kitchen and asked Chong the cook what he did with the choice parts of the

beef carcasses hanging in the freezer, such as sweet breads. "Oh," he said, "big boss-man, he no likum--I give to Sam." Sam was the big yellow cat that hung around the kitchen growing fat on such delicacies. So I asked Chong if he would cook me up a serving of those favorites of mine and he agreed.

A few nights later, in our common dining room, a plate of sweet breads appeared before me. Every eye at the table focused upon the dish and then came the questions as to what I intended to consume. When I disclosed the identity of the morsels, a look of disgust appeared on the manager's face while a few of my fellow gourmets expressed envy at my good fortune. After this we occasionally had meat for dinner that was roasted or fried, but the boss stuck to his boiled beef routine.

Spring finally arrived and with it the welcome sight of wild flowers poking through the still remaining thin blanket of snow. The company decided to close down the prospect due to lack of profitable ore. I packed my belongings and returned to Kellogg, only to learn that the company had no other jobs to offer me. Just before leaving to return to San Francisco, I heard of another mine about to start up in the same general part of Idaho as Dixie, which also needed an assayer. I met the principals of the company and they seemed interested in my

background. As we see in the next chapter, I took the job and learned some extremely valuable lessons about people.

MOVING FURTHER UP THE LEARNING CURVE

Boarding the bus at Dixie, Idaho in the Spring of 1938 for the trip back to Kellogg, it never occurred to me that I would soon return to a nearby mining district far more remote and wild than the one I was leaving.

While in Kellogg readying to return to my San Francisco home, I heard about a prominent Idahoan named Walter Remer who had recently obtained a lease on a gold property in the Buffalo Hump area of Idaho and needed a Mining Engineer. We met and he presented me with a most unusual proposal. Due to his limited finances, Remer wanted someone to work for room and board until the mine turned a profit and then receive back pay due. He also promised a good salary in the future if the mine prospered. Remer had a very convincing manner and possessed an interesting background as a commercial flyer. Although well-known and liked in the Northwest, I found out that he had very limited mining experience. After returning to San Francisco and finding no other more attractive job offering, I accepted Remer's offer and

returned to Lewiston, Idaho, his home.

In late May, my new boss and I drove up the Clearwater River to the tiny town of Elk City, then past Orogrande as far as the car could go. We walked several miles over a rough, deeply rutted road, lined with deep snow banks, leading to the mine site. Buffalo Hump had once been the scene of a gold rush in 1895 but the ore, although rich, proved difficult to separate out the gold content. When the Alaska gold rush started in 1898, the miners deserted Buffalo Hump en masse and headed for the Klondike. We found numerous buildings in various states of disrepair and large quantities of rusting mining machinery, just as the miners had left it 40 years before. The best preserved building had been a two story hotel in the old camp which we decided could house enough people to reopen the mine. All around us towered lofty snow-capped peaks, a crystal clear creek cascaded nearby and in the distance a herd of deer grazed peacefully in a luxuriant meadow.

We returned to Lewiston and made arrangements for supplies and equipment to be delivered to the property. The advances in metallurgy now made it possible to profitably extract the gold from the ore, so Remer leased a gold recovery mill in Elk City, planning to truck the ore there as it came from the mine. He hired a road

contractor to make the area more accessible by truck and soon the place hummed with activity.

In the meantime, Remer had inveigled a half dozen men with mining experience to come aboard under terms similar to mine. What a bunch of hard-bitten characters! But to their credit, they knew how to drill, blast and timber to produce the ore.

One of the crew Remer recruited, because of his small size, became camp cook. At first he performed creditably but soon the quality of his meals began to decline. It turned out that "cookie" liked his booze and had managed to smuggle in an ample supply which he imbibed freely. Remer confiscated his liquor cache but the meals failed to improve noticeably. The cook continued to get his kicks from the cooking sherry and the "canned heat" he discovered in the kitchen supplies.

Our truck driver, coming back one night with supplies from town, sighted a tiny deer caught in a road drain. He rescued the animal, brought it to camp and began feeding it milk from an improvised baby bottle. The darn thing survived and became a fixture around the boarding house. When the cook rang the bell for mealtime, "Baby" as we called it, led us all to the dinner table. It developed a passion for cigarette butts and would consume every one it found. Eventually the deer grew

spikes and became mean, so we found a home for it with a farmer who raised deer for a hobby.

Remer had promised to put our deal in writing, but every time I brought the subject up, he artfully avoided committing himself. This caused me considerable concern, but it seemed nothing could be gained by quitting. The mine production had reached the point where the ore could be trucked by contract the 40 miles to the leased mill in Elk City. It became my job to help in the milling operations and to do all the assaying. We stored the rich concentrates in steel drums preparatory to shipping them to the smelter in Montana for refining.

Idaho winters begin in October and this one became one of the coldest on record. I boarded with a family in Elk City and slept upstairs in a loft. Each morning I could see blobs of ice on the nails protruding through from the roof. Only after the cook had a fire going in the kitchen did I arise, jump into my clothes and head for the warmth of the stove. The biggest challenge came when one had to visit the outside privy. I soon found why the holes were lined with animal fur. Without such protection, one would stick to the seat in 40 below weather.

December snows made it impossible to haul any more ore from the mine so Remer shut everything down

until the following Spring. The smelter charged exorbitant prices to treat the concentrates because of the excess of arsenic and other undesirable minerals. This, along with higher mining, milling and transportation costs than expected caused the returns to fall far short of anticipated profits. My share came to $500.00, not much considering the primitive living conditions and the bitter cold weather. I failed to obtain a firm future offer in writing from Remer and decided I had gambled enough on this misadventure. Upon returning to San Francisco for Christmas my spirits rose perceptibly and shortly afterwards I went to work in a California gold mine with the full pay and responsibilities of a Mining Engineer.

Before running into Walter Remer, I thought I knew enough about people to avoid being taken in by such a smooth operator. Women drooled over his extreme good looks and he seemed to have endless numbers of influential friends. He attended Christian Science ceremonies whenever possible, had no bad habits that I knew of, and worked hard. However, I learned later that the next year he managed to raise enough money to erect a small mill at the mine site. Needing an expert metallurgist, he brought in an experienced engineer and promised him the same sort of deal that he had offered me. After the mill had been built and running, the metallurgist discovered that Remer

didn't intend to cut him in on the profits as promised and sent him packing with a token payment just like he treated me.

I never did find out if the mine became successful or not, and I never learned what became of Remer. Sooner or later his misrepresentations to honest people should have caught up with him, although sometimes such slick chicanery goes unexposed for years. I have no compelling desire to find the answers, but someday, if our paths cross, I am certain that he will act as if nothing like what I have described ever happened.

I LEARN THAT LIFE IS REAL AND LIFE IS EARNEST

The sobering Idaho experience of receiving little more than a pat on the back from Remer left me dubious about remaining in mining. But sorely in need of funds and recently engaged to be married to the secretary of a mining consultant for whom I worked a short while before going to Arizona, I accepted a job as a Mining Engineer at a gold mine on the Feather River in California.

The mine could better be described as a prospect, barely surviving on a month to month basis. The Mine Manager believed no one could repair machinery as well as he and during any one of the frequent breakdowns, several mechanics could be seen standing around watching him repair a piece of equipment. This lack of attending to his managerial duties contributed greatly to the operation's problem.

The single employees of the mine lived in a large, rambling combination bunk house and dining quarters. The accommodations didn't amount to very much, neither did the food. Fortunately, my roommate, Conrad

Thomas, had been at Cal with me and had the job of assayer. Working seven days a week, with only an occasional day off, we made the best of a sorry situation.

Mines located in such isolated places as this tend to attract a polyglot of old characters amongst the workmen. One such employee remained aloof from his fellow workers, never leaving the area to go into Quincy, the closest town of any size. I liked the fellow and we became quite friendly, often going to the local Saturday night dance together. On one such occasion, sitting at the bar in innocent conversation with a woman whom I had never seen before, her drunken husband suddenly appeared wielding a chair and attempted to bring it down on my head. Only the quick reaction of my friend, who deflected the chair so that it fell harmlessly to the floor, probably saved my life. The incident brought on a typical barroom brawl, with people hitting each other indiscriminately. During the melee, my friend and I made our hasty getaway. A month or so later, it became very evident why he stayed close to the mine. The police descended upon us one evening and took him away. We found out later that he had a criminal record and the law had been on his trail for a long while.

In June of 1939, my fiancee and I became married and after a short honeymoon, begrudgingly given by the

Mine Manager, we rented a cabin in the railroad town of Keddie, about 20 miles from the mine. The escape from the boredom of the bunkhouse and the unimaginative food came as a real blessing. But the primitive living conditions failed to be conducive to a happy marriage for a city-bred girl and after six months we separated, followed several months later by a divorce. Shortly after the break-up, I quit the lackluster job and returned to San Francisco to look for another situation, preferably in some industry other than mining.

Pacific Gas and Electric Co. had just started an hydro-electric project on the Pitt River in northern California. I applied for a job there and went to work in the San Francisco Engineering office. After a few months, they transferred me to the Hydro Project as a Construction Engineer.

I had always considered the Feather River country about as isolated as one could get in California, but after viewing my new location, Feather River seemed like a metropolis. The utility had taken over a group of very old summer cabins along the Pitt River for living quarters, quite a come down even from the less than commodious accommodations at the gold mine. But we engineers boarded with a local family living on a farm and could the wife cook! I can still picture the steaming

ears of mountain corn, freshly picked and dripping with home churned butter. I also can almost taste her apple pies, made from the fruit of the enormous apple tree in their front yard and the cereal in the morning covered with cream so thick it had to be ladeled out by a spoon!

Building a solid ingress into the area became a high priority and the job fell to me as the Project Engineer. The company hired a contractor to perform the work and soon we had a road suitable for the heavy equipment eventually the project would require. My experience in road building in rough mining country stood me in good stead.

The site of the proposed dam had no access road, so we rented horses and rode to the location every day to do the initial surveying. This phase of the job became almost a vacation. During lunch break we ate the delicious food prepared for us by our boarding house lady, then took a swim in the river until time to return to business. Again my experience riding horses in the Sierras kept me from looking like a novice.

In the Fall of 1941, I became married to a young lady whom I had met while working in the utility's San Francisco office. After another short honeymoon, she remained in the City where she worked, and I continued living at the job site. Construction of accommodations

for single employees and houses for those married were well under way and when I approached the company about a house, they informed me that only those who had been married before the work commenced qualified for company housing. This perturbed me greatly and I mulled over in my mind whether I should stay with the corporation or not. Events on the morning of December 7, 1941 made the decision for me. It didn't appeal to me to be 200 miles away from my bride while the Japs invaded our coast. I applied for and received a transfer back to the San Francisco office, where we took an apartment situated only a few blocks away from Ocean Beach. Getting a place on the street car at night going home required plenty of skill and it wasn't unusual to see people hanging on to the front and rear "cow catchers." I stayed with Pacific Gas and Electric until the following year, then took another job with an Engineering Design firm in San Francisco, where I remained until the Yukon beckoned in 1943.

SKIRTING THE ARCTIC CIRCLE

During my senior year at Berkeley, the Big C society put on its circus, a money-raising event held every four years. The Mining Association, along with a sorority, whose name I've forgotten, teamed up to take over a part of the arena under the huge tent, calling it "The Malemute Saloon." The girls dressed in turn-of-the century clothes and served what was supposed to be grapefruit juice but by adding gin to it, we made it more like the stuff they served in the Klondike. We also put on skits and as some of my classmates acted out the parts, I recited the poem by Robert W. Service immortalizing that saloon. Everyone had a great time and we made some money for the Mining Association. It never even entered my mind that seven years later, in the maelstrom of World War II, I could be thrust into the middle of the beautiful and untamed land so vividly described by the poet.

By the Spring of 1943, my Draft Board had reached the bottom of its barrel and began looking menacingly at me. Hampered by poor eye sight which kept me out of

R.O.T.C., I pictured myself peeling potatoes in some forlorn Army Camp in Texas for the duration. To avoid such a calamity, I signed an employment contract to work as an engineer on the Canol Project in Canada and Alaska.

Feeling smug over escaping the draft, I boarded a train in Oakland bound for Canada and eventually Edmonton, Alberta, the Project headquarters. The trip proved to be anything but pleasurable. Before leaving San Francisco, I had been given shots for every conceivable disease known at the time. Lying in the upper berth of the sleeping car, it seemed only a matter of hours before I would die from the alternate fever and chill that shook my body. When recovery finally came and we reached the Canadian Rockies and Jasper, the stunning scenery to be seen all around made me glad to still be alive.

In Edmonton, the office told me that travel to Whitehorse, Yukon Territory, my final destination, must wait for better flying weather. During this hiatus, they put me up with a charming Canadian couple; I ate very well, explored the city and read innumerable books in the excellent public library. My hosts were intensely interested in hearing about San Francisco where they had spent their honeymoon. At 4:13 A.M. on the morning of April 18, 1906, they had been rudely awakened by the great earthquake. As they looked out of the window of their

hotel on McAllister Street, they watched in amazement as the marble facing on the City Hall peeled off like the skin of a giant orange. They managed to leave town before the devastating fires started, never again to return.

The weather finally cooperated to let me take off for Whitehorse in an old aluminum clad Boeing Tri-Motor plane. We were buffeted around like a leaf before the wind for almost the entire trip and, this being my first journey by air, I thought to myself, "Oh! Lord, will I ever see my family again?" The weather turned nastier so we had to stop in Dawson Creek where we were put up in a barracks. At 4 A.M. the pilot awakened us and off we took to more "white knuckle" flying. What a great feeling to step off the plane in Whitehorse and still be alive! During my stay in the North Country, I learned to appreciate the skill and courage of the area's renowned bush pilots.

Whitehorse reminded me of pictures of a 19th century frontier town. It boasted one main street, a restaurant or two, and a clapboard two-story hotel which became my temporary quarters. Work on the refinery that would process the oil from the fields on the Mackenzie River had already started. The oil source lay about 700 miles to the east as the eagle flies, but closer to 1,000 miles over the wildest, most uninhabited landscape

imaginable. The pipeline had begun to snake its way over that largely unexplored wilderness and was to present a major source of headaches before completion. Pump houses needed to be built every few hundred miles along the pipeline and overseeing the building of a couple of them became my job.

Transportation between construction sites often proved to be a worrisome source of frustration. The best way to travel in the North Country is by air and I always headed for the nearest airport to hitch a ride on a freight-carrying plane going in my direction. Failing this, it meant taking the most available vehicle, which could be anything from a Jeep to a large truck. Driving the Alcan Highway, then under construction, presented enormous problems. Long delays, deep mud during the Spring thaws, heavy truck traffic and uncertain night time lodging constantly challenged the patience of the traveler. Trying to get a good night's sleep at a construction camp in the dead of winter meant closing one's ears to the constant din of diesel engines. If a truck or tractor engine were turned off, it could not be started up again the next morning without the time-consuming job of applying steam to unfreeze it in the 40 below weather.

The principal topics of conversation among the

workers in the camps usually were addressed to the questions, "When are we going home?" or "How did you stay warm in the winter?" Less often the subjects of how to outwit the mosquitos in the summer time or where to get an extra allotment of liquor dominated the conversations. It did little good to dream about returning home since everyone had to fulfill a year's contract or pay his own way back. As to staying warm, early on I learned that crawling into a sleeping bag stark naked kept me quite comfortable at night, although climbing out in the morning took a bit of doing. I also discovered that wearing silk stocking, moccasins and mukluks kept my feet comfortably warm, knowledge gleaned from the old timers who had learned it from the Eskimos and Indians. The ubiquitous mosquito only became a nuisance during the summer evenings when they appeared in droves, almost blackening the sky. We always wore head nets when going outside and never went to bed without protective netting. Far worse, it seemed to me, were the gnats or "no-see-ums" as the natives called them. They could penetrate the best of nets and their bites in one's eye or ear often became infected. I recall one time in midwinter when in order to pour concrete, a tent was put up over the forms and stoves lighted to keep the concrete from freezing. The gnats, which hibernate in the ground during freeze-up, must have

thought it was spring, because they came out in great swarms, forcing the workmen out of the tent. If one wanted liquor, he could purchase one bottle a month from a government store at about $5.00 a bottle. If one saved his allotment to the end of the month, it would bring up to $50.00 to those suffering from deprivation.

I found the best way to endure the hardships and loneliness of the far North was to enjoy the unparalleled scenery, marvel at the indescribable Northern Lights, eat heartily of the surprisingly good food and learn all I could about the country and its people. For awhile, my job brought me to Watson Lake, near the border of British Columbia and a lovely spot. There I met a French-Canadian priest involved in building a log cabin church. We became quite good friends, especially after I received permission to furnish him with some of our surplus building materials. A genial member of the Royal Canadian Mounted Police taught me much of the lore of the land and how vital to the security of Canada is this highly respected organization. During extended stays in other locations, Indians and Eskimos gave me insight into their customs, ways of life and their problems, first hand information not easily found in books.

This enormous, costly effort to thwart the Japanese from cutting off the vital shipment of aviation

gasoline by sea to Alaska came to a precipitous halt when the threat diminished after the Battle of Midway. When we visited the area in 1984, Whitehorse had returned to a somewhat larger, more modern version of the bustling place I first saw in 1943. Although this great country over which I traveled from Anchorage to the banks of the mighty Mackenzie River failed to reflect the romantic fantasies of Service's poetry, it left me with enough memories to last a life time.

AN INVOLUNTARY INTERLUDE

After two years of playing "mouse and cat" with my draft board, early in 1945 I found myself aboard a bus, along with 15 other hapless recruits, headed for San Diego and the United States Navy. This depressing development filled me with anger towards a system that seemed unfair. Hadn't I tried to join the Army Corps of Engineers in 1940, even before we entered the war, to help build tank repair facilities for the British in Eritrea, only to be turned down because of poor eyesight? Being a bachelor, it would have made much more sense to take me then than now, a married 33-year-old, to swab decks. And how far would $50.00 a month go to support a wife and two small children? Such malevolent musings didn't help my situation one iota because almost before I knew it, my head had been shaved, my body clothed in an itchy wool uniform, and my feet shod with shoes two sizes too wide.

But by gradually accepting my destiny, I even began to like parts of this strange new life. The food in Boot Camp was surprisingly good, the relatively new

barracks sparkled with cleanliness and I found some fellow sufferers with whom I could communicate intelligently. The nation's draft boards had dug so deeply into their barrels that my new acquaintances included a Mining Engineer, the head of the Texas Forestry Department and a Ph.D. from Ohio State.

Everyone else in my company had carefully kept his hand down when the Chief asked for a volunteer to take care of the mail. It seems that the words of wisdom in the services is, "never volunteer for anything." But to me it sounded like a good way to avoid the late afternoon exercises and running the obstacle course, so I raised my hand. The job fitted my predicted scenario perfectly and never once did I regret the decision.

After ten weeks of training, we received a short leave to return to our homes. By then I had learned a lot of Navy lore, if not much else, and tried to have my leave extended via a telegram to the Camp, citing imaginary ills. But the Navy brass saw through my translucent tale and ordered me back pronto or face the consequences!

Upon returning, my orders instructed me to report to the Naval Ship Repair Base in San Diego. Although I hardly knew one end of a ship from the other, such dichotomies didn't bother the Armed Forces then and probably still don't. My hopes had been for an assignment

to the Navy Radar School for a year of training, but that dream never materialized.

About the only similarity between Boot Camp and the Repair Base was that they both were located in San Diego. The quality of living dropped drastically, with unappetizing food and old, dilapidated barracks. But the biggest difference hit me after getting to know the sailors and officers stationed there. Most of the former had become hardened and cynical and the latter, except for the very top echelon, appeared to know even less than I did about repairing ships!

Fortunately, the Navy utilized my experience by putting me with an engineering group responsible for designing sections of ships that had been severely damaged in combat. Rather than towing the vessels back to Hawaii or the mainland for repairs, photographs and sketches of the damaged areas were sent to our base. We designed new parts that were then fabricated in the base shops and flown back to floating drydocks in the Pacific. There crews installed them as replacements for the destroyed sections, allowing the ships to sail into action again. This technique greatly limited the otherwise catastrophic effects of the Kamikaze attacks by Japanese pilots.

In our group one sailor stood out above all the other enlisted men: a native of Rhode Island with a

degree from MIT in Naval Architecture. Without his knowledge, I doubt if nearly as many ships or submarines would have been repaired. When the young officers, euphemistically called "90 day wonders" ran into a problem on the shipways, they called for Chris who always had an answer. We became fast friends and our liaison meant salvation for us both. We spent our liberties listening to classical music at the YMCA or visiting La Jolla, selecting the house we would build someday, always avoiding the usual haunts of sailors which usually became scenes of drunkenness and arrests by the Shore Police. After the war, Chris moved out West and today is an eminently successful Consulting Naval Architect. We see each other occasionally but have more important subjects to discuss than our unlamented days in San Diego.

Almost ten years after my 1946 discharge from the Navy, the whole experience came back in an unusual way. While supervising an addition to the Climax Molybdenum Mill in Climax, Colorado, I sometimes went into nearby Leadville in the evening for a change of scenery. On one such visit, while passing by the local Elks Club, I noticed that they had scheduled a meeting for that night and being a member of the organization, I decided to attend. During the ceremonies I was introduced to the members. After the meeting, one of the officers rushed

over to me, grabbed my hand and exclaimed, "Downey, don't you remember me? I used to make the blueprints for you engineers at the repair base in San Diego." I remembered him all right as a rather simple soul, well-suited for such an undemanding job. I also recalled the terrible coffee he brewed every morning that grew stronger and stronger as the day wore on. He told me that he now held the office of County Treasurer and expected to be mayor some day. I hope that the rest of my rather unpretentious shipmates at the base fared equally well.

FROM SHIPS TO SHAFTS

Once set adrift by the navy in the spring of 1946, I soon found my way back into the Mining Industry. Through the Alumni Placement Office at Berkeley, I landed a job as mining engineer with a large Eastern based chemical company, about to sink an exploratory shaft in Wyoming to develop a deposit of Trona, discovered while drilling for oil. I had to consult my reference book to learn that Trona is a compound of sodium, hydrogen, and carbonate, very valuable as an industrial catalyst and prior to the Wyoming find, extremely rare in nature.

Leaving my family in California, I struck out for new experiences in the "Equality State." My trip by train ended at Green River, the closest town to the shaft site. Happily, waiting for me at the station, was John Jacobucci, the only local company employee. A Chemical Engineer, John would eventually oversee the construction of the Trona refinery. We became close friends during my stay, a relationship that lasted until his recent death.

After locating a room for me in the town's larger

of two hotels, we drove West in the company car for about 15 miles to the job site. There I met the construction people hired by the company to sink a 12-foot circular concrete lined shaft some 1500 feet deep, located in a most unhospitable environment--a dry, desolate domain of sheep and sagebrush.

Work had already begun on the shaft after the completion of various buildings and a comfortable office for me. My job included checking the vertical alignment of the shaft, the proper thickness of the concrete lining, the monthly progress made by three shifts of miners working seven days a week and miscellaneous surface engineering preparing for permanent hoisting, ventilating and refining facilities.

Most of the 2,500 inhabitants of Green River worked for the Union Pacific Railroad and the town offered little entertainment or culture other than a weekly movie. The Jacobucci family invited me to dinner regularly, providing wonderful evenings of fascinating tales of the West by Mrs. Jacobucci, a direct descendant of Ebenezer Smith, the famous scout and explorer of the early 19th century. And most welcome were the home-cooked meals, a respite from the only restaurant in town, run by a Greek who seldom changed his fly-specked menu.

The work in the shaft began to demand more and

more of my time until finally the company agreed to build a place for me and my family near the job site. With the help of the contractor's engineer, I designed the two bedroom house, being especially careful to call for double pane windows, good insulation all around the shell and enclosed front and back door porches. This proved to be a wise move when the temperature dropped to forty degrees below zero that winter. Despite the intense cold, we never experienced any discomfort in our home on the range. We moved into our new place in time to share a gala Thanksgiving feast with friends from town and the construction superintendent and his family who also lived near the work place. (All the other employees lived in either Green River or Rock Springs and were transported to and from work in a company-furnished bus.)

Moving from the temperate climate and abundance of greenery found in California to this high desert country took considerable getting used to by my wife and our two pre-school aged boys. But like most newcomers, they soon learned to love the enormity of space, the profusion of animal life and the spectacular sunsets. Fortunately, we usually had no more than a foot or so of snow. We never tired of watching the great long freight trains as they roared by on the nearby Union Pacific mainline. With two big multi-wheeled Mallet engines

pulling and another coal-fired monster pushing for the climb over the Rockies, the sight especially fascinated the boys. One day an engine brought several sleeping cars to our siding and out stepped the Board of Directors of the company, all the way from the East Coast. We had a great time explaining the project to them as all the while they kept casting furtive glances about them as though expecting at any moment to be attacked by a band of savage Indians. Visits by salesmen always helped to relieve the boredom with their news of the outside world and their funny jokes. In good weather we would search the surrounding terrain for 10,000 year old Yuma Indian arrowheads. We failed to find any, but did discover some fish skeletons embedded in rock near the dinosaur dig not far from Kemerer, Wyoming. Living in such isolation, every diversion, no matter how small, took on great proportion and importance.

One day a figure appeared in the doorway of the office decked out in whipcords, high boots, a jungle jacket and wearing a large pith helmet on his head. One of the engineers, upon seeing him remarked, "Dr. Livingston, I presume." He failed to get the point, but turned out to be a scientist from the U.S. Geological Service in Washington, D.C. His mission was to search for previously undiscovered minerals. We soon became very

fond of this interesting, intelligent person and he became a familiar sight on the waste dump with his small geology pick, looking for new compounds. Unfortunately, his search proved unsuccessful.

As the shaft penetrated ever deeper into the unexplored earth, problems kept cropping up. One of the most serious involved a flow of extremely caustic water that forced its way through the concrete joints and despite expensive efforts to seal it off by filling diamond drill holes with gunite, it continued to plague us for the duration of the job. Everyone working in the shaft had to wear heavy protective clothing and be careful not to get the liquid in his eyes.

Then came the inevitable tragedy often associated with the dangerous game of mining. After finishing their shift, several miners signaled up top for the man-bucket which they loaded with equipment, including some wood planks. Two of the men got into the bucket while the third stood on the rim and signaled for the hoist man to start bringing them to the surface. About half way up, one of the boards protruding from the conveyance caught on a steel member in the shaft, causing it to tip sharply, forcing the man standing on the rim to lose his grip and fall to his death. A sad, traumatic period followed this unfortunate accident but life and work go on, and after a

couple of days, shaft sinking continued.

At long last the bore reached the Trona deposit. It proved to be even more extensive and valuable than the drill cores had shown. The company began putting together comprehensive plans for new machinery and equipment to exploit the rich find.. But after working for more than two years under some of the most difficult and dangerous conditions I had ever experienced, plus the fact that the company had recently been taken over by a large conglomerate, I felt that the time had come for me to move on.

Today, the area is marked by numerous shafts, mills and new towns as other companies came in to share the bonanza discovered accidentally over 40 years ago. Undoubtedly, if we had remained, our lives would have taken an entirely different course. However, the move turned out to be the right one for me, enabling me to eventually end my career in an industry far removed from mining and one in which I would be far happier and more successful.

A CHANGE IN CAREER

The years from 1950 to 1955 marked a period of transition from the Mining Industry to the field of Construction. Unable to develop sufficient business as a Mining Consultant in San Francisco from 1948 to 1950, there followed jobs with several different Engineering-Construction companies; supervising the building of an ore benefication plant, a power house, a highway and bridge job and work in oil refineries and chemical plants throughout the western U.S.A. The work required me to be away from home much of the time and in 1955 the opportunity arose to take a job in estimating in a San Francisco contractor's office, a most welcome change.

This period of stability saw us purchase a home in Palo Alto, a place that provided good schools for our family now grown to two boys and two girls. It also gave me the chance to enroll in the evening school program at U.C. Extension so as to qualify for admission into an MBA course.

Then in the Fall of 1966 Del Monte Corporation

offered me a job as Project Engineer overseeing the design and construction of a large research facility in Walnut Creek. This, the last move made in my working career, proved also to be the best. Although a large, world-wide corporation, there existed throughout every section the feeling of a small, friendly group and before long I enjoyed first name basis with many of the top executives. My boss, Ken Sanger, after finding out that the work went well under my supervision, left me pretty much to my own resources. The company offered many benefits I had never enjoyed before, and as I completed new assignments, my pay and responsibilities rose accordingly.

The engrossing work at Del Monte and the rigorous schedule of evening school helped somewhat to soften the traumatic blow of separation and subsequent divorce after a marriage lasting more than 25 years. My job began calling for me to travel to places like England, Canada, Mexico, Costa Rica, Hawaii and many areas of the U.S. Being without family ties made it easier for me to undertake such a life. Before retiring in 1976, I had been given the title of Chief Engineer of Construction and Director of Energy Management and Conservation, presenting me with ever greater opportunities to use my experience. I consider myself extremely fortunate to have discovered a work situation at Del Monte that I had been seeking for

most of my working career.

After retirement and my third marriage, I opened a consulting office in San Francisco, specializing in small design jobs and energy audits. In 1978, as the Embarcadero area where we lived expanded into a crowded neighborhood, we decided to move to Santa Rosa. I continued commuting to my office in San Francisco for awhile but since business didn't warrant it, I closed up shop and continued my work from our Santa Rosa abode.

About this time a new door opened for me, quite unexpectedly. While at Del Monte, I worked with Robert McLees, a young Mechanical Engineer from Bozeman, Montana, and we became good friends. Bob's father owned and operated one of the largest sheet metal and roofing contracting businesses in Montana and after Bob had obtained enough experience working for Del Monte and a large southern California contractor, he returned to Montana to work for his father. Within a short period he began to rise rapidly in the organization, after grasping the rudiments of office management and accounting.

Young McLees soon could see some areas in the company that needed outside advice and in 1979 he offered me an assignment as company consultant, after getting Board of Directors' approval. From that time up to the present, this relationship has given me some of the most

interesting and rewarding opportunities to use my MBA skills and knowledge that I have known. In 1981, the Board of Directors elected me to the Board as the first outside member, where I served until 1985.

My work with McLees still continues, but at a much lesser pace. Bob still poses challenging assignments and questions to me from time to time, an inestimable help in keeping my mind alert. Alberta and I have become very fond of Bob and his family and when we visit Bozeman it is like being with relatives. Jack McLees, Bob's father, has retired and the task of running and building the company rests on his son's shoulders. The few crumbs that I tossed out on the waters when I helped young Bob along in his career have come back multiplied many times over in the form of the choicest loaves any one could hope for.

This marks the formal ending of my autobiography and as a good miner, I should say, "She's deep enough."

BIBLIOGRAPHY

Bohakel, Charles A. A Brief History of the Empire Mine at Grass Valley. Grass Valley, CA: Golden Sierra Printing, 1980.

_____. A History of the Empire Mine and Grass Valley. Nevada County Historical Society, 1968.

O'Brien, C.C. A Concise History of Ireland. New York: Beekman House, 1972.

Peele, Robert. Mining Engineers Handbook. New York: John Wiley and Sons, 1927.

Rasmussen, Louis J. Ship's List Arriving in San Francisco, 1850-1853. San Francisco Historical Records, Colma, CA, 1946.

Rogers, Andrew. A Hundred Years of Rip-Roaring Rough and Ready. 1952.

Sargent, A. A. Sketch of Nevada County. San Francisco: 1856.

Scott, Mel. The San Francisco Bay Area. Berkeley: University of California Press, 1959.

Silliman, Benjamin. Empire Mining Company, Ophir Hill, Grass Valley. San Francisco, CA: E. Bosqui and Company, July, 1867.

MISCELLANEOUS PUBLICATIONS

"Empire Mine," California Department of Parks and Recreation.

"History of Nevada City," Nevada City Chamber of Commerce.

Moore, J. Pumping and Hoisting Works.

INDEX--J. Ward Downey

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Born in Lead, South Dakota, where her father became chief metallurgist for the Homestake Mining Company. Her mother was a high school geology teacher before marriage.

Attended schools in Lead, South Dakota, Dana Hall School, and Wellesley College, Massachusetts. Phi Beta Kappa. M.A. in English, University of Denver. Assistant to the President, Elmira College, New York. Married to Langan Waterman Swent, mining engineer.

Since marriage has lived in Tayoltita, Durango, Mexico; Lead, South Dakota; Grants, New Mexico; Piedmont, California.

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